

# American Artisan

Founded 1880

The Warm Air Heating and Sheet Metal Journal

Vol. 96, No. 10

CHICAGO, SEPTEMBER 8, 1928

\$2.00 Per Year

The heater for particular people



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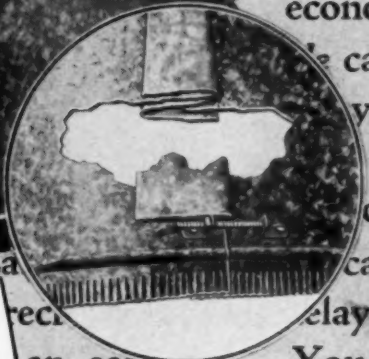
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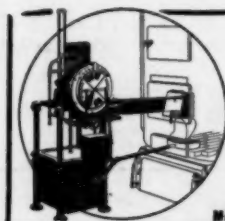
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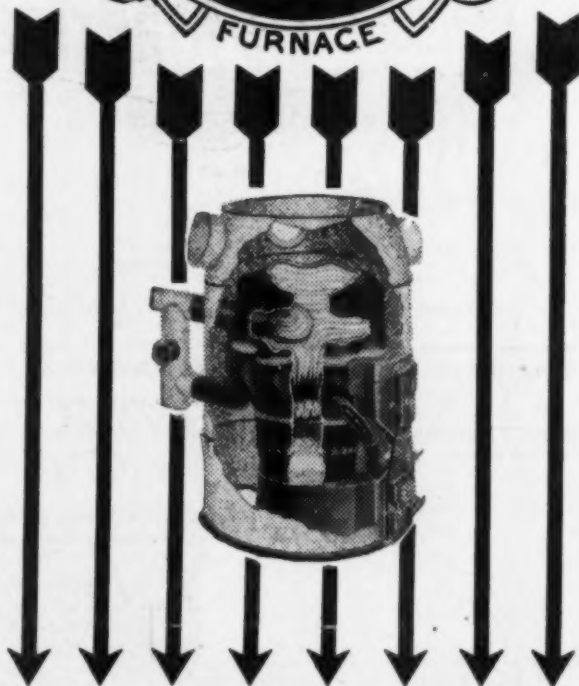
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and  
Sheet Metal Work

# American Artisan

The Warm Air Heating and Sheet Metal Journal

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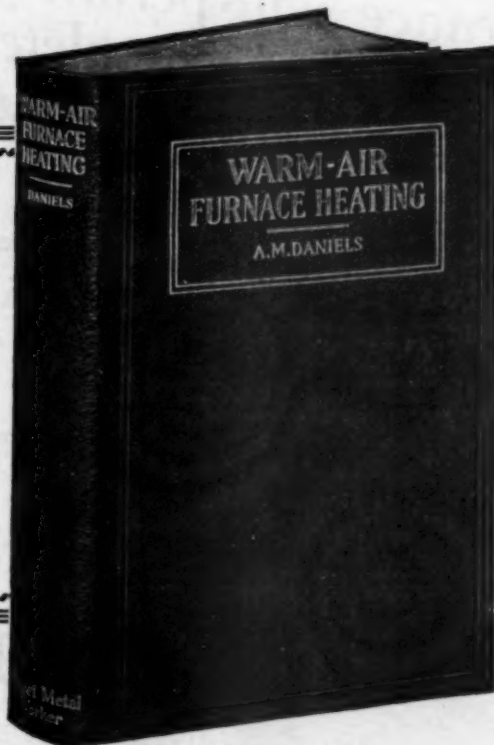
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## CHAPTER HEADINGS

1. Historical.
2. Typical Gravity Pipe Warm-Air Heating Systems.
3. Types of Warm Air Furnaces.
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19. Hot-Water Supply.
20. Leader Pipe Sizes.
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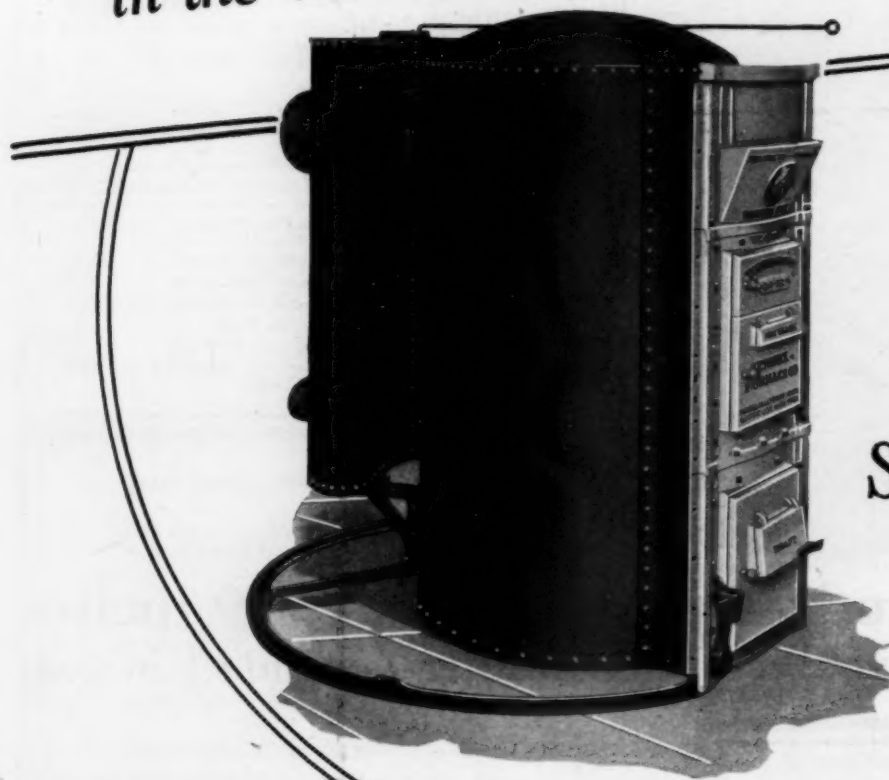
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**Lennox Furnace Company, Inc.**  
Marshalltown Iowa \*\*\* Syracuse New York





# American Artisan

The Warm Air Heating and Sheet Metal Journal



Vol. 96

CHICAGO, SEPTEMBER 8, 1928

No. 10

## Constructing Pattern for 5-Way Sheet Metal Y-Branch

*Problem Treated from a Geometrical Point of View to Familiarize Student with That Method*

By O. W. KOTHE, Principal St. Louis Technical Institute

**F**EW tradesmen ever meet with a problem such as we show in the accompanying drawing where we have 5 different branches leading from a main stem and where each one is of a different size and design.

Some men will seek to build up the branch by making larger pipes and then cutting them off until something is made.

To treat the thing geometrically, we first draw the elevation, especially the base 1-0 and the height of center prong, together with its diameter, as a-b. I then on each side we can build the side prongs as "O" and "Q." After this we can develop the plan view, starting out with the section for base "M" and then describing the small section "N." From its center we draw lines at 45-degree angles to represent each division for the branch as well as to establish miter lines between the different prongs. Next fill in the sections for the prongs in plan, as "O"- "P"- "Q"- "R."

After this treat the section "M" into equal parts and erect lines to the base as well as to points "N" of elevation and draw the radial lines in the body. The line 13-9 of elevation is drawn as a straight miter from 13 to A, much the same as any ordinary two-way Y branch. Then the line 7-9 will lie in the 45-degree plane and will be merely a straight line as the plan will indicate. Now as the miter 9-13 of elevation is curved form a front view or a plan view and developing this we receive a curve similar as we show in plan as 9-11-13. In

work of this kind it is best to make all four miters alike and then build the prongs to the center miters, in that way much work can be eliminated and the fitting will be of uniform design as well as save considerable work. The prongs "P" and

of plan as 7-9-11-13, etc., and extend them to intersect the vertical lines in diagram "S." This will allow drawing the developed section or girth along edge of miter line.

Now in developing true lengths for getting at the patterns the center prong can be readily developed by the sweep method, much the same as any tapering pipe or tee joint which has miter lines on its surface. But the side prongs must each be developed separately and for this a separate diagram of true lengths must be developed for each prong. We can use the same altitudinals as A-B-C-D of elevation for the major part of each prong; but the altitudinals resulting from the small ends of prongs, as 2-14, must be projected separately for each diagram. In this way the body of prong will be developed to one section and one diagram in a large measure, while the throat will be built to fit to the center prong.

So by picking plan lines, as 1-2, 2-3, 3-4, 4-5, etc., to 13-14 and setting them into our diagram of true lengths—always considering the line on which we are working as we did each part of the fitting its proper altitudinal position, we can then develop through lengths, as H-T. Such a separate diagram must be developed for each prong. By observation it will be seen that the prong "Q" is quite the same as "O" only that the former is oblong and hence the points in true length diagram will be the same. Here it is only the plan lines that will have different base projections. When these things are accounted for little

### HARDWARE GOLF TOURNAMENT

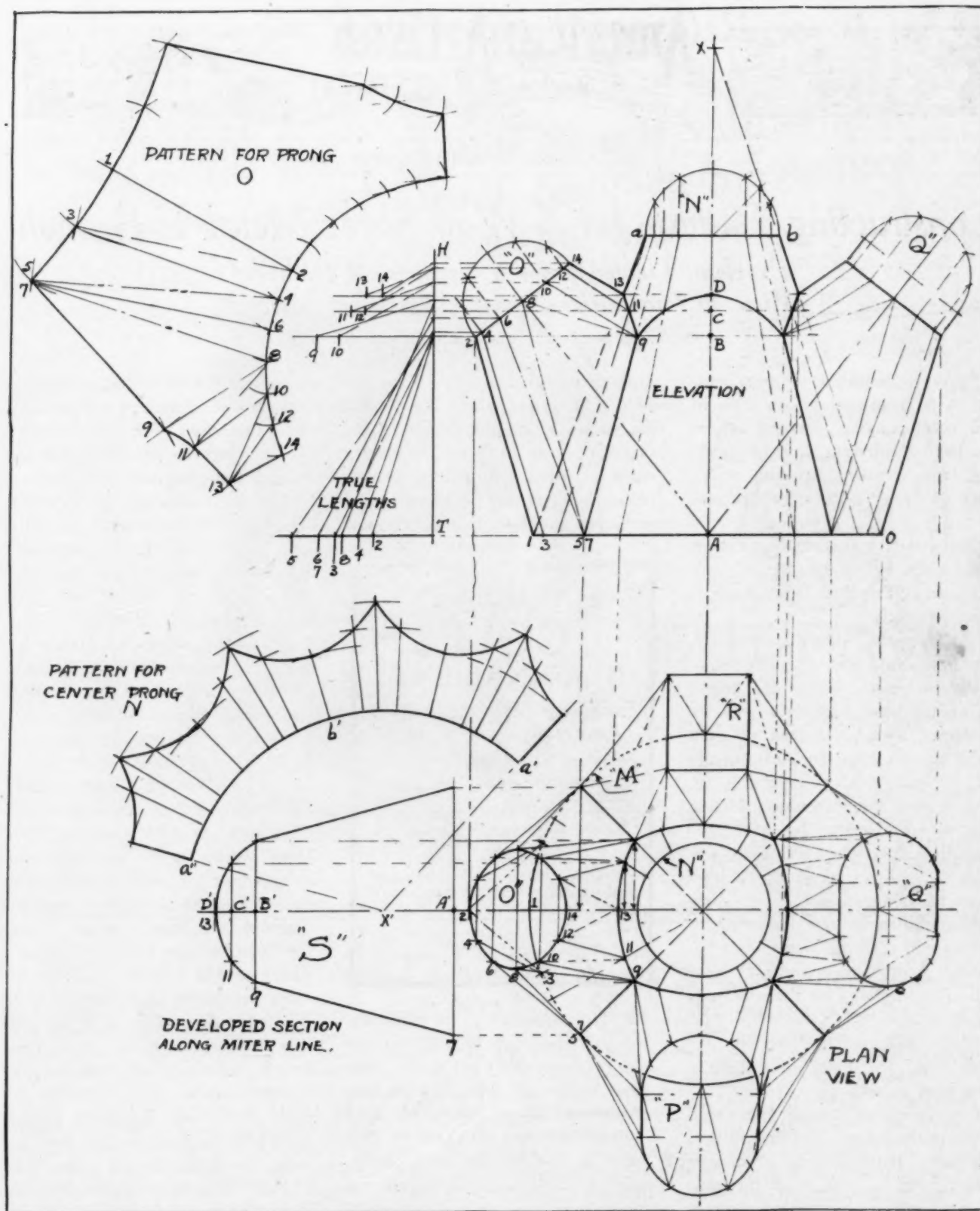
*Excelsior Springs, Mo.  
Sept. 14, 15 and 16, 1928*

**F**OR the accommodation of those going from Chicago to the above Tournament, there will be a special car attached to train No. 25 of the Chicago, Milwaukee, St. Paul & Pacific R. R., leaving the Union Station, Chicago on Thursday, Sept. 13, at 6:00 P. M. central standard time, and arriving at Excelsior Springs, Mo. at 6:48 A. M.

Reservations on this special car may be made direct with B. J. Schilling, General Agent Passenger Dept., 100 W. Monroe St., Chicago, Ill.

"R" are not necessary in elevation, although they can be put in position if desired. By projecting lines from 9-11-13 of elevation we can readily develop the curve 9-D, giving the different altitudes of this miter, as D-C-B. In actual development work we only need the miters 9-7-13.

The next step is to develop true section through this miter which is done by picking the altitudinal distances from elevation at A-B-C-D and placing them in the horizontal line to the left of plan as A'-D' in diagram "S." Draw horizontal lines from each of the points in the miter



Pattern for 5-Way Y Branch

trouble need be experienced, in arriving at the patterns.

In this case we develop the pattern for "O" starting with line 1-2 which is equal to that of elevation 1-2. Then we use girth spaces for

small and from section "O" and strike small arcs, as at 4. For the base we pick girth spaces, as 1-3 from plan and set it as 1-3 in pattern. Then we pick true lengths 2-3 from diagram, and using point

2 in pattern as center, we cross arcs in point 3. Next pick line 4-4 from diagram, and using new point 3 as center, cross arcs in point 4. Repeat in this way, taking small girth

(Continued on Page 58)

# What Is the Relation of Research Work to the Warm Air Furnace Business?

*Are the Tangible Results Obtained  
Helping the Installer to Sell More Jobs?*

By L. W. MILLIS\*

**R**ELATION of Research work to furnace business. Probably most of us think of Research work as a method of arriving at accurate, though perhaps theoretical conclusions. At the same time all of us regard the business of installing warm air furnaces as a strictly bread and butter affair, although we must admit rather more secret satisfaction in a heating job well done than in some other bread and butter job, equally well done, but in which all the factors can be easily seen. There are features of warm air work that cannot be instantly seen and even if comprehended under a certain set of conditions, such as temperature, fuel, etc., would be vastly different under another set of conditions. It, therefore, stands us in hand to get and use (don't forget the word use) accurate information from unprejudiced sources, in order that those served by our craft may receive all they have a right to expect. It is, therefore, reasonable to assume that there is, in fact, a definite "Relation of Research Work to Furnace Business."

This association recognizes that fact and year by year listens to a dry statement of facts dug out slowly and laboriously and with the utmost care by the highly trained painstaking engineering staff of the University of Illinois. The work is fostered by the National Warm Air Heating Association and its scope is a matter of negotiation.

Most of the expense that can be expressed in dollars is borne by the National, but the literature so far as publication is concerned is the property of the University. Nevertheless the members of the National

Association receive each year confidential mimeograph reports of such work as has reached a state that warrants definite conclusions. None of these are for publication except in University bulletins which naturally try to treat the subjects in which the information has reached a fairly useable stage.

Perhaps I should explain that part of the work is done in the laboratory, while other work is done in the Research residence. A portion

		PLATE No. 8.				
Ceiling 9 ft. ....	71.33	72.9	73.7	74.7	75.8	76.8
Breathing 5 ft. ....	70.	70.	70.	70.	70.	70.
Floor .....	68.33	66.4	65.3	64.1	62.8	61.5
Outside temp. ....	60.	40.	30.	20.	10.	0.
Difference in temperature per foot of height .....	.333	.72	.94	1.18	1.44	1.70

of the work in the residence is to corroborate the laboratory work while a portion is also research. Much of the research work in the residence has been in determining the advantage or disadvantage of different kinds of return air ducts.

It may be of interest to you to know that steam men are seeking to get improved floor temperatures. I understand that when heat is rising in a steam plant that the ceiling temperature rises rapidly. The tests

		PLATE No. 9.				
Ceiling 9 ft. ....	68.66	72.81	74.26	75.6	78.	80.3
Breathing 5 ft. ....	68.	69.60	69.70	71.	72.20	73.5
Floor .....	66.33	66.	65.	65.	65.	65.
Outside temp. ....	60.	40.	30.	20.	10.	0
Difference in temperature per foot of height .....	.333	.72	.94	1.18	1.44	1.70

run in zero weather taught us that in order to preserve the same temperature at the floor that it is necessary to raise the temperature of the breathing line higher than 70 degrees.

Plates No. 8 and No. 9 are not taken from any research tables, except that the difference per foot is taken from one of the tables showing the range in one certain test. It occurred to me that this method of showing the effect might bring it before you rather clearly. Plate No. 8 is based on 70 degrees continuously 5 feet above the floor, and 4 feet below the ceiling. It shows that the floor temperature is lowered as the outside temperature

falls.

Plate No. 9 is made up to show a nearly uniform temperature on the floor regardless of the outside temperature and shows what the temperature would then be five feet above the floor, also the ceiling temperature is given.

These differences would not seem great to husky men whose lower limbs are well clothed. However, we must remember that little children live entirely in the lower

levels. Elderly people and others of low vitality sit much in low rockers, while the prevailing modes of dress condemn ladies of all ages and all conditions of vigor to subject much of the unprotected body to the low-

\*Excerpts of an address delivered at the recent convention of the Missouri Sheet Metal Contractors' Association held at Sedalia.



est temperature in the room. These conditions make it obligatory on the worth while furnace man to provide warmth as the changed living conditions demand. I say changed because the children could not make a great outcry. Elderly or infirm people expect to be uncomfortable in cold weather, but the scantily clothed lady of today demands comfort and in no uncertain terms. She is controlled by the prevailing style and the furnace man who values her opinion of his heating plant will act accordingly.

Many things have happened since your Sedalia meeting that affect the furnace man. I think you may be interested in a hasty sketch of them. They show that organization of a high order is needed and that the various organizations are inter-dependent. Last year my attention was called to a code regulating heating equipment in garages. It was fostered by the insurance men and would have eliminated warm air furnaces entirely. The American Society Heating and Ventilating Engineers Committeemen had gone on record for it. And the National Warm Air Heating Association had not protested. In fact their representative had apparently concurred in it. I will not take your time to go into details, but new men were finally put on. E. B. Langenberg of St. Louis was appointed for the National Warm Air Association, and E. K. Campbell of the Campbell Heating Company, Kansas City, Missouri, was appointed as representative of the American Society Heating and Ventilating Engineers. Mr. Campbell gave much time and money to this cause. Two trips to New York, one to Buffalo, two to Chicago; and two other meetings in Indiana and Kentucky, and probably some other trips were made by him in our interest. His personal expense has been great, but the matter seems to be headed toward a condition in which warm air furnaces may be installed without insurance penalties.

Without the united efforts of these organizations the warm air industry would have received a tre-

mendous setback. At the December meeting in 1927 of the National Warm Air Heating Association an invitation was extended to the Furnace Manufacturers' Association, known as the Midland Club, and to the Western Warm Air Furnace Supply Association and to a similar organization on the Pacific Coast to come into the National. The objective of all these bodies were not identical and the constitution of the National did not cover some of the activities of the others.

I think I am justified in taking a moment of your time to tell you something of the work of the Western Warm Air Supply Association so far as it is related to the Missouri members. Perhaps you are not aware that the West has lead the East in efforts to establish better heating conditions. The Western Association had sufficient vigor and possibly lung power to continue its efforts until today we have a Standard Code for installation. The late lamented John H. Hussy of Omaha, had a leading part, but we must recall that certain Missouri members labored long and earnestly and with a vision that amazed the far Easterners.

Alphabetically, I recall Henry Bauman of the Meyer Furnace Supply Company, John B. Fehlig of the Excelsior Heating & Supply Company, John R. Payne of the U. S. Register Company, all of Kansas City, also Herb Symonds who makes registers down in St. Louis, and I am told stands ready to sell you all you need. These men have done valiant pioneer work in your line.

After six months of cooperative work on the part of the officers and committees of the three organizations a new constitution and by-laws was offered at the April meeting of the National Warm Air Heating Association, which would so enlarge its sphere of activities that it would create a foundation for unification of all the activities of the three bodies. In addition it opens the way to greater usefulness to the industry. In addition to technical work on heating the new organization will

try to bring about better legislative conditions, especially in the prevention of ruinous legislation, such as the Garage Code mentioned and some of the provisions of the proposed uniform lien laws, and the new menace of building construction as it refers to furnaces.

At present National Warm Air advertising is being done. A new and important feature is the establishment of a committee known as a Better Business Committee. There is manifestly much for them to do. There is room for a vast amount of work in gathering and making intelligible, all sorts of statistics. All in all, the year has seen great changes in the industry. I think I am justified in saying that the changes have been less noticeable in states having organizations cooperating with the larger bodies of the country.

I should close right now but I cannot resist the opportunity to call your attention to the great alluring mystery that all studies of heat lead us to. Until the last few years heat was regarded as a rather low form of energy. But now advanced scientists who study heat tell us that in the last analysis it is alluring and entrancing of all the sciences. Heat is not a thing. It has no weight. But gas companies, electric companies and coal and oil companies sell it by accurate measurement.

You are privileged to sell a furnace to a user and say to him that if he will buy a ton of coal that your equipment will extract 95 per cent of the heat in the coal somewhere between the grate and the ridge of the roof where the chimney goes through, and that you will put 60 per cent of it in the bonnet of the furnace, and furthermore that you will deliver at registers 75 per cent of that 60 per cent of 95 per cent of 100 per cent of that non-existent thing—heat. I ask you seriously if any other organization has a more entrancing line of endeavor than you have. It's a great challenge. It is an especial challenge to the young man because the industry, as a whole, is in its infancy.

### Scully Steel & Iron Company Issues Revised Catalog

The 154-page catalog just issued by the Scully Steel & Iron Company, 2364 South Ashland Avenue, Chicago, covers the months of July, August and September.

This book is of particular interest to purchasing and mechanical departments of shops, factories, industrial plants, tool rooms, etc., using steel bars, beams, channels, plates, sheets and other steel products, as well as shop tools, equipment and machinery. It is sent out without charge to interested parties.

### SPOT NEWS

Glenn C. Archer has purchased the interest of Floyd W. Rogers in the Rogers-Linden Furnace and Manufacturing Company, 517 Queen Anne Avenue, Seattle, Wash.

Monk & Evers, sheet metal works and furnaces, Spokane, Wash., have added about \$1,000 worth of new equipment.

The Green Foundry and Furnace Works, Third and Elm Streets, Des Moines, Ia., has the furnace heating contract for Immaculate Conception Church in Fairbanks, Ia.

The Everett Sheet Metal Works, 2719 Rockefeller, Everett, Wash., has the heating contract for residence of Geo. J. Petersen, 10th and Grand, that city.

Emil Brown, Los Angeles, Cal., has the contract for sheet metal work on stages at the Metro-Goodwin-Meyer studios.

The National Cornice Works, 1323 Channing Street, Los Angeles, Cal., has the contract for sheet metal and fire doors for Brain & Keeler building.

Patrick Johnston has engaged in business at 1001 West 25th Street, Los Angeles, Cal., as the Unit Furnace Company.

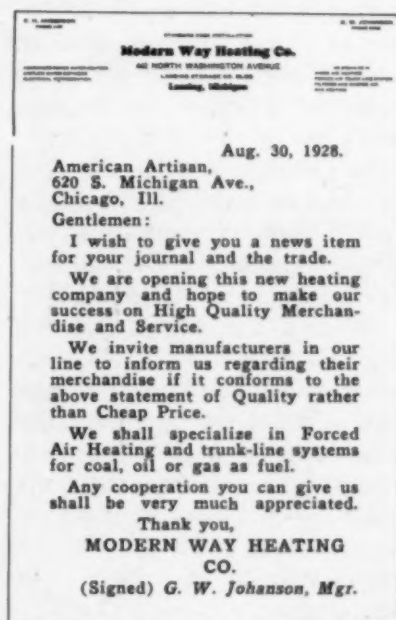
Max Richter and Alfons Richter have engaged in the general sheet metal and ornamental stamping business at 221 East Vernon Avenue, Los Angeles, Cal., as Richter Brothers.

The John G. Wright Sheet Metal and Furnace Company, 513 Jeffer-

son Street, Waterloo, Ia., has the heating contract for residence of H. J. Parks.

The Stegman & Trainer Sheet Metal and Furnace Works, 710 Jefferson Street, Waterloo, Ia., has been awarded heating contract for residence of Nellie M. Allen.

### Here's a letter that shows still more progress for BETTER Warm Air Heating



The Chevey Furnace Company has been incorporated in Louisville, Ky., by Wm. Jekel, 4129 Taylor Boulevard.

James H. Edwards, Phoebus, Va., has been awarded roofing and sheet metal work for barracks building of Third Engineering Company, Fort Humphreys, Va.

The Fire Protection Products Co., San Francisco, California, has moved its metal door manufacturing plant from 3117 Twentieth Street to 1101 Sixteenth Street.

The West Coast Sheet Metal & Roofing Co. has been incorporated in Tampa, Fla., by Oscar Worrell, 705 Azeale Street, and others.

The Nuway Furnace Company, 1125 South Peoria Street, Tulsa, Okla., has been awarded the heating contract for residence of G. C. Spillers.

The Flour City Furnace Co., 1717

East Lake Street, Minneapolis, Minnesota, has the warm air heating contract for two double bungalows for R. C. Soons.

Carstens Brothers, 1216 Bank Avenue, Superior Wisconsin, have been awarded the roofing and sheet metal contract for the Douglas County Sanitarium.

The Hawkeye Tin Shop, 96 Second Avenue East, Cedar Rapids, Iowa, has been awarded the warm air heating contract for Spanish bungalow of T. R. Rogers.

Paul & Larson of Odebolt, Iowa, have been awarded the warm air heating contract for parochial residence for Sacred Heart Roman Catholic parish at Early, Iowa.

Frank Tullis, 2204 East Douglas, Wichita, Kansas, has been awarded warm air heating and sheet metal contract for Duplex apartment of John Dunn.

The Broadway Sheet Metal Works, 324 Vancouver Street, has the sheet metal contract for warehouse at Fourteenth and Raleigh Streets, Portland, Oregon.

Robert J. Neilan, 17 Allston Way, San Francisco, California, has been awarded sheet metal contract for industrial building of Victor Hoelscher and Daniel Rosenbaum, at Eleventh Street, near Howard Street, that city.

Morrison & Co., 74 Duboca Avenue, San Francisco, California have been awarded the sheet metal work, and the Folsom Street Iron Works, Seventeenth and Missouri Streets, the ornamental iron work.

The Superior Sheet Metal Works, 461 Market Street, San Francisco, California, has been awarded the sheet metal contract for addition to the Lazear School, Oakland, California.

The Arcade Cornice Works, 721 East Twelfth Street, Los Angeles, California, has been awarded the sheet metal work for Chas. E. Cooper apartment building, in that city.

Fred W. Dee has been awarded the sheet metal and copper roofing contract, and the A. J. Bayer Co. the ornamental iron and brass contract for the Villa Riviera Apart-



ments, all of Long Beach, California.

The Linkon Sheet Metal & Hardware Co., 3105 Wabash Avenue, Los Angeles, California, has been formed by Norman Linkon, 1042 North Evergreen Avenue, and others.

Nicodemus Brothers, 307 Towson Street, Fort Smith, Arkansas, has been awarded the sheet metal contract for the Goldman Hotel annex in that city.

I. C. McWhirter, 1818 North King Street, Greenville, Texas, is in the market for stamped 18-gauge iron trigger guards, in large quantities, for toy guns.

The Art Metal Construction Co., Jamestown, N. Y., has been awarded the hollow metal door and trim contract for \$500,000 Arcade in St. Petersburg, Florida.

The Southern Cornice Works, 116 South Cincinnati Street, has been awarded the sheet metal work and roofing contract for James E. Duffy \$200,000 mercantile building, in Tulsa, Oklahoma.

The Nelson Roofing Company has been awarded the roofing and sheet metal contract for Incarnate Word College building, in San Antonio, Texas.

The Southern Ornamental Iron Works, 2425 S. Harwood Street, Dallas, Texas, has the miscellaneous iron contract for Plaza Hotel in Corpus Christi, Texas, at \$14,763.

The American Foundry & Furnace Co., 508 Guardian Life Bldg., St. Paul, Minn., has the heating contract for school building in Coleraine, Minn.

The Grand Sheet Metal Co., 60 East 3rd, North, Portland, Ore., has been awarded the sheet metal and roofing contract for factory of Western Wax Paper Co.

Lease & Leighland, Great Falls, Mont., has been awarded the sheet metal and roofing contract for high school at that point.

The Reliable Sheet Metal Co. has been incorporated in San Francisco, Cal., with a capital stock of \$25,000, by F. R. Anderson, J. J. Parker and O. P. Justice.

Dunphy & Davis, 5156 Fulsom

Blvd., Sacramento, Cal., have been awarded the sheet metal work for school building at Fair Oaks, Cal.

The Detroit Steel Products Co., 417 Market street, San Francisco, Cal., have been awarded the metal sash contract for Weaver-Wells Co. business building in Oakland, Cal.

The A. J. Bayer Co., Sharon Bldg., San Francisco, Cal., has been awarded the hollow metal door contract for Telephone Exchange in Modesto, Cal.

The Dick Young Sheet Metal Works, 218 North Hydraulic St., Wichita, Kas., has been awarded the sheet metal contract for public garage of Henrion Improvement Co.

The Dempsey-York Co. has been organized in Statesville, N. C., by D. H. York, of Statesville, and others, to manufacture fender rollers and sheet metal machines.

Ahrens & Son, 911 S. Poinsetta street, West Palm Beach, Fla., have been awarded the roofing and sheet metal contract for apartment and store building being erected in Palm Beach for the Palm Beach Co.

#### Oxy-Acetylene Service Without Limitations

An opportunity is seldom presented to get anything like a complete picture of the significance of an industrial process to men and to corporations engaged in many different lines of production. One of the newest processes in the metal working industries is that of oxy-acetylene welding which, while it is used only in connection with metals, has found application in scores of places not ordinarily classed as metal working plants.

How this process has grown to be an important factor in almost every phase of human activity is illustrated in the outline of topics covered in a report of the Oxy-Acetylene Committee of the International Acetylene Association which is being prepared for presentation at the meeting of this association next November. The following is a list of some of the more important subjects which it is considered neces-

sary to cover in the annual report:

Acetylene Generators, Welding and Cutting Apparatus, Welding Supplies, Steam Railways, Street Railways, Marine, Airplane, Oil Industry, Automotive, Steel Furniture, Power Plants, Heating and Ventilating, Pressure Vessels, Structural Steel, Boilers, Pipe Lines, Steel Mills, Foundries, Textile Mills, Automatic Machine Cutting, Automatic Machine Welding, Testing Welders, Training Welders, Sheet Metal, Ornamental Iron Works, Metal Spraying, Bronze Welding, Domestic Automatic Refrigeration, Commercial Refrigeration, Hard Facing Tools, Mines, Lumber and Wood Products, Heat Treating, Highway Construction, General Contract Operations Status of Welding in Engineering Schools, Research, Procedure Control, Welding Ferrous and Non-ferrous Metals, Rules Governing the Industry, Status of Job Welding.

One who has the opportunity to see only one or two simple welding operations seldom realizes that over a hundred thousand of these torches are in daily use in the country, and on so many different kinds of work that it has never been possible to compile a complete list of its uses. The above set of topics is not an attempt to show all the uses of oxy-acetylene welding, but just an outline of the more important subjects which are under consideration at the present time.

#### 5-WAY "Y" BRANCH

(Concluded from Page 54)

from section "O" and the large girth for the base from section "M" of plan; while for the miter cut we take the lines from "S." In this way we work from one point to another until 13-14 is established and this allows drawing lines through all points where arcs cross and we have the pattern. The same process must be followed for each branch, giving due consideration for the sections to be used in the case of the girth and the true lengths, after which edges are allowed for assembling and the development is finished.



# America's Prosperity—and Artisan Prosperity

*New Business Book by a Banker Gives Interesting Sidelights on Making People Want More Merchandise*

EVERY furnace and sheet metal man will be interested in reading the new business book, "America's Prosperity: Its Causes and Consequences," by Paul Mazur, a banker connected with the house of Lehman Brothers of New York City.

## "Obsolescence"

After naming a number of prosperity causes, Mr. Mazur ascribes much to the keenness of America's business men. Being able to make people want more merchandise and then want it again is one example of this modern keenness. "*Obsolescence*" or *disuse of an article because it is out of style, has been a great contributing factor to our prosperity*, and frequent reference is made to this new influence. In fact, this is one of the keynotes of the book.

"Obsolescence" has permitted factories to keep busy and furnished employment to millions of men at good wages. He cites many examples of this: automobiles, color in the kitchen, furniture, radio, etc. For example, the watchmakers have been able to create an entirely new market by making owners of perfectly good thick watches dissatisfied and wanting new thin ones.

## Mass Production

Mr. Mazur devotes some time to the subject of ceasing of mass production on non-staple articles.

Henry Ford was the classic example of success in mass production and for a time (up until the spring of 1927) Mr. Ford would have been pointed out as the great industrialist.

His principle was: "Make a lot of goods—volume and efficient methods will make the price low—and price will sell the goods."

This principle was successful as long as price did sell the goods. But one of the necessities of mass production is continued selling of the same item. And the growth of

"style buying" is directly opposed to this.

So when in 1927 Ford friends began to flirt with the prettier, newer cars, sales of Fords began to drop. One of the absolute requirements of mass production is tremendous and continuous volume of sales. The sales didn't come, so production had to stop for the time.

## Making and Selling

Many of the points which Mr. Mazur makes are already known, but we don't often think of them. For instance, "the greater the sales, the greater the volume, and the greater the volume, the lower the cost," is axiomatic. But in order to produce great volumes of sales we must incur great sales expense.

So while we may say our sales expenses are high, yet they enable factory expenses to be lowered. Sometimes, however, the factory demands so much volume to operate at capacity that the cost of securing this business is beyond economic reason.

Thus we have the question: How to arrive at the relation between economy of production and the cost of disposing of that production.

Mr. Mazur seems to believe that old continued mass production of many goods is doomed because of more frequent style changes.

## In the Furnace and Metal Field

Perhaps we are not so quick to devise changes and make people feel that old merchandise is "out of style" as we should be. Mr. Mazur says that "style" has been one of the greatest factors in making business. Here's food for thought. Should we make people want more stylish registers, etc., and even be willing to junk the old and replace with the new?

And "price" merchandise is not the big seller any more that it was.

## Installment and Selling

"One can argue either way about the good to the country of install-

ments" and this is discussed at length.

Undoubtedly, it is easier to induce a man to work some next year to pay for an article than to get him to pay out of last year's savings for it. Installment selling is recognized as an important contributing factor to American prosperity. While it increases cost of selling, yet it creates volume and helps to decrease cost of manufacture.

## What Lies Ahead?

In brief, Mr. Mazur expects the coming years to witness some form of compromise between the two forces—mass low-cost production and high-pressure distribution.

"Mass production sells on price and depends upon continued volume of business. 'Style' influence is against this. It tends toward frequent changes in merchandise sold at a good price which is hard on mass production and factory efficiency."

## Here's a Problem for Some Bright Sheet Metal Man to Solve

C. W. Langenstein, Jefferson, Texas, is confronted with a problem of procuring a fan or blower that will handle maize on the stem. The blower would have to be located in the building and so arranged that it would draw the maize from box cars into the building. The system should be large enough to keep two men busy feeding it. The maize must not pass through the fan. The distance from the location of the box car to the place in the building where the maize is to be deposited is about 135 feet. What Mr. Langenstein wants to is whether this can be successfully accomplished and what size fan or blower will be necessary. Any sheet metal contractor having experience with systems of this kind will oblige Mr. Langenstein by giving him the benefit of their experience.

## Little Instances Where Sheet Metal Is Proving Its Supremacy

### *Fire Hazard Reduced in Kennet Square With Metal Roofs*

By C. H. THOMAS

**S**UPREMACY is not a big word, but it designates excellence, especially when applied to sheet metal. In this article I propose to point out quite definitely just how sheet metal has been found supreme in several particular instances when compared to other materials which might have been used but were not. The first instance I have in mind is that of a contractor in Pennsylvania who was

brooders, and many other devices that were formerly constructed of wood, thus showing how sheet metal is supplanting wood.

At Painters Cross Roads, near Concordville, Pennsylvania, an entire set of buildings there owned by the Brinton Club are roofed with metal, and this set of buildings, being quite valuable, is visible for a distance and is a permanent adver-



Sheet Metal Serves Industrial Plant and Dwelling Alike

building a house. He had gone over very carefully the various roofing materials that were called to his attention. After much consideration and debate he determined that sheet metal shingles would serve him best, and these he finally used.

Wood, as everyone in this country knows, is a thing of the past in so far as roofing is concerned, and metal is taking its place.

Another instance of the use of sheet metal is that of a large mill at Yorklyn, Delaware, owned by the National Fibre Company. In this large factory fiber products of every description are made, and satisfactory ventilation is assured by the use of a battery of large sheet metal ventilators.

In our drives through the country districts we see sheet metal garages, silos, hog pens, chicken

tisement for metal roofing. The man who handled the job has received much favorable comment from the job.

In Kennett Square the buildings in the center of the town are largely covered with metal. This city has suffered much fire loss in the past and is taking precautions against repetition by covering her roofs with metal.

Copper gutter and conductors have taken their place, too, on many new homes that have been erected.

Fire hazards and the increasing number of fires make it more than imperative to stress the use of sheet metal at every opportunity. With the means at hand these days for advertising, the sheet metal man should have plenty to do and the best of materials to do it with.

Every day sees some new appli-

cation for sheet metal. Make your customers feel that you are here to give them the full benefit of your life-long service with sheet metal as the watchword.

### **Sheet Metal Employers' Association, Cleveland, Ohio, Holds Annual Outing**

Euclid Park, Cleveland, Ohio, cooled by the breezes from Lake Erie, was the place of the annual outing of the sheet metal contractors and the Warm Air Heating Association of Cleveland recently. It was a bright day and happiness reigned as king. The only dark spot on the horizon to mar the pleasure of the affair was the drubbing which the furnace men took at the hands of the sheet metal contractors in the ball game. The score of 11 to 6 does not do justice to the superior fielding of the warm air men but the "Goose Goslin" hitting of the tanners put out the fires in the soldering pots of the warm air dealers. Harold S. Sharp of the Henry Furnace and Foundry Company, and A. W. Howe of the J. M. and L. A. Osborn Company, were umpires.

The athletic stunts brought forth much fun and were won as follows: Egg and spoon race, Mrs. E. E. Engler; 50 yard dash, Lucile Wolover; small girl race, Katherine Fath; boys' 100 yard dash, Robert Aignworth; boys' 50-yard dash, Tom Aignworth; boys' three-legged race, Robert Aignworth and Dian Mannen, Jr.; lemon throwing contest, Mrs. Frank Kalhoff; shoe race, Russell Glass; egg tossing contest, Edward Gardner and Robert Janke; nurse and patient feeding contest, Irene Riestler and Edward Fassinger. The games were under the direction of James M. Saunders, secretary of the associations, and Campbell McRae and John Tyla, the latter formerly recreation commissioner of Cleveland.

The large picnic grounds became the scene of an old fashioned basket picnic when the games were finished after which there was dancing. About 250 members and their families attended.



## Indiana Sheet Metal and Furnace Men Carry no Coals to New Castle But Get Chicken Dinner There Instead

*Meeting Will Be Held Friday Evening,  
September 14—All Hoosiers Invited*

**A**RRANGEMENTS for the district meeting at New Castle of the Sheet Metal and Warm Air Heating Contractors' Association on Friday, September 14th, are complete and assure those in attendance of a wonderful evening. While the meeting will be for the most part informal, the New Castle Chamber of Commerce, who are sponsors, have secured Clarence A. Jackson, past State Commander of the American Legion, to deliver a short address. Mr. Jackson is widely known as a dynamic speaker with something to say. He will be allowed to talk on a subject of his own choosing, but it will be a subject of interest to business men.

E. G. Scotten, president of the New Castle Chamber of Commerce, will be on hand to address a few words of welcome to the contractors. The Coca-Cola Quartet, a musical organization of more than local fame, will broadcast some harmony for the entertainment of the boys.

Elmer Livezy, general chairman of arrangements, made a master stroke when he secured the cooperation of the New Castle Chamber of Commerce in putting over this event. Elmer has on his committee Guy L. Baker, live wire secretary of the New Castle Chamber of Commerce, Lambert Joldersma, New Castle heating contractor, Nelson Miller and J. C. Shriener, New Castle sheet metal contractors. He has out-of-town committeemen as follows: Will Strassner and Kenneth Ricketts, Anderson; H. E. Griffin and Frank Wenning, Batesville; Orie. Hudleston, Cambridge City; H. Cain, Commersville; Everett Boone and Mr. Worland, Greensburg; Wilbur Woodward, Marion; O. P. Hirons and H. I. Michaels, Muncie; Walter Perkins, Rushville; W. E.

Erown and J. C. Pearson, Shelbyville; Chas. Roland, Richmond.

The contractors will meet at 6:00 o'clock informally, but the dinner will not be served until 7:30, which will give out-of-town contractors time to finish up their day's work before leaving. A chicken dinner will be served at the Elliott Coffee Shop. Both Elmer Livezey and Guy Baker are willing to stand behind this Elliott chicken dinner as the best in seven states.

One valuable feature of the program will be a talk on insurance.

The committee plan to have C. F. Stothard of the Hardware Mutual Insurance Companies, to talk informally and answer questions relative to all kinds of insurance. There has been a change in Indiana compensation rates. This change is universal, effective alike in all insurance companies. Mr. Stothard will explain just what these changes are and will answer questions regarding the changes and other insurance matters.

Everything points to a good attendance, as well as to a good meeting. Contractors will find much of value in these meetings, as well as a mighty good time. It is particularly hoped to attract to the meeting contractors who are not in the habit of attending the meetings and conventions of the sheet metal and furnace trade.

## Jobbers Appeal to Sheet Steel Mills to Retain 2% Cash Discount

*Special Meeting Held in  
Pittsburgh, September, 5, 1928*

**A**T a special meeting of the Metal Branch of the National Hardware Association held at Pittsburgh, September 5th, the following resolutions were adopted for presentation to the sheet steel mills.

Meeting was called by President Schoedinger as a result of the notice sent to jobbers announcing reduction of cash discount from 2 per cent to 1/2 of 1 per cent.

### **Resolutions Adopted by Jobbers**

Your committee wishes to present, as a result of the deliberations of the special meeting held in Pittsburgh, Wednesday, September 5th, the following resolution, which was originally adopted in 1899—

"That it is the sense of the National Hardware Association that the discount, 2 per cent for cash, 10 days, formerly given by the manufacturers of steel and iron goods, be not construed as bank interest, but as a premium for prompt payment and as an insurance or protection of credits, and fur-

ther that such or similar discounts be retained where still allowed, and that we urge its restoration where it has been discontinued"—

when a similar movement to lower the cash discount was proposed.

The reasons for this are as follows:

(1) The cash discount is an insurance or protection of credit for the reason that it permits the extension of credit on a 10-day basis to those who are only entitled to credit for this period and no longer.

(2) If the 2 per cent is withdrawn it will tend to increase accounts receivable of mills and jobbers to a figure that would in many cases necessitate refinancing and considerable additional capital.

(3) The 2 per cent cash discount should not be regarded in the light of bank interest, but as a premium for prompt payment or a penalty for failure to make payment within the 10-day period.

*(Continued on Page 64)*



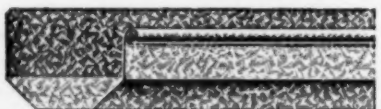
Osborn Quality  
Eaves Trough, O. G. & Box Gutters  
Are Made in 10-Foot Lengths of Galvanized Steel,  
Ingot Iron, Copper, Zinc or "Lead Cote"



Osborn O. G. Regular Pattern



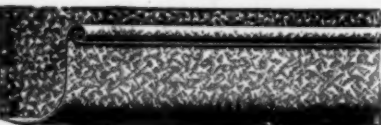
Flat Back Gutter



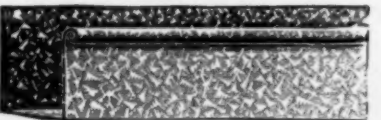
Style C



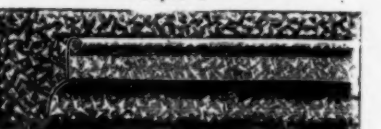
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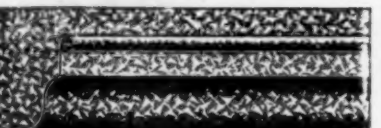
Style E



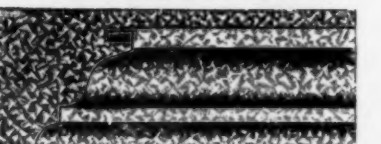
Style F



Style G



Style H



Style J



No. 3A-75°



No. 1B-45°



No. 3-75°



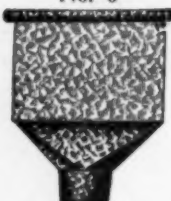
Rain Water Cut-Offs



No. 6



No. 4



No. 3



No. 7

Osborn Quality  
Conductor Heads

Are Made of Galvanized Steel, Ingot  
Iron, Copper, Zinc or "Osborn's  
Lead Cote"



A



B



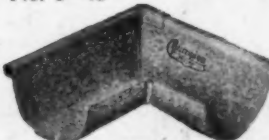
D

Eaves Trough Fittings  
and Accessories

Elbows and  
Mitters



No. 1-45°



Outside Corner



Inside Corner

Osborn Quality Eaves Trough



Cold Rolled Copper and Zinc,  
Made in 10 ft. Lengths



Single Bead Slip Joint Eaves Trough



Double Bead Slip Joint Eaves Trough



Single Bead Lap Joint Eaves Trough



Double Bead Lap Joint Eaves Trough



No. 1

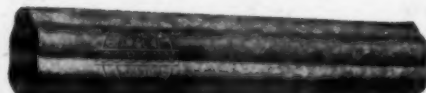
THE J. M.  
**OSBORNE**  
CLEVELAND

"Everything Used in"

Osborn Quality Conductor Pipe



Plain Round Pipe



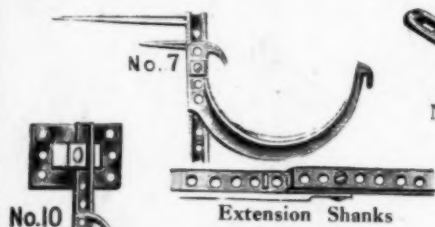
Round Corrugated Expanding Pipe



Square Corrugated Expanding Pipe



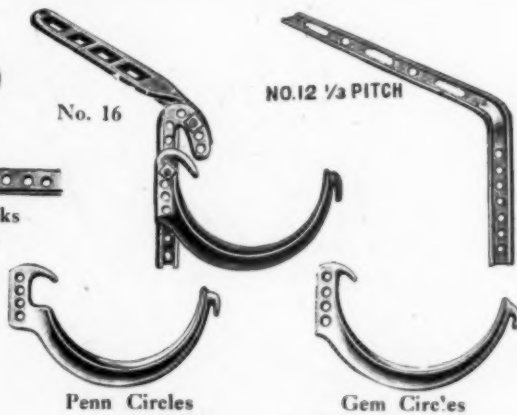
Polygon Expanding Pipe



No. 10

Osborn's Triple Twist Wire Hangers

We Also Carry Wire Conductor Pipe Fasteners



Penn Circles

Gem Circles

Shanks and Circles

### Self-Acting Hinged Conductor Hooks

Made of Malleable Iron, Tinned Plain Round and Round Corrugated



For Brick

For Wood

### Minnemeyer Conductor Fastener

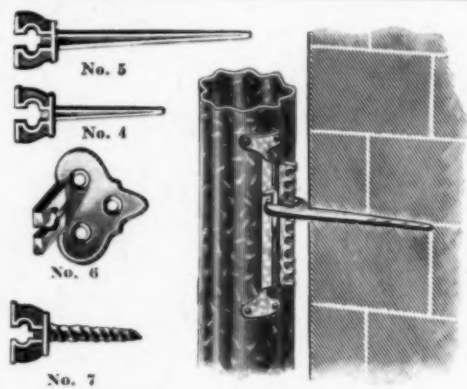
Made of Malleable Iron, Electro Galvanized



Square or Round, For Wood



Square or Round, For Brick or Stone



Berger's Patent Pipe Fastener



Flat Back Gutter Hanger

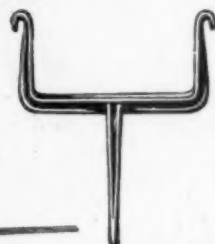


Osborn Strap Hangers Black Japanned Wrought Steel or Copper

Osborn's Golden Star Hanger In Use and as Packed for Shipment



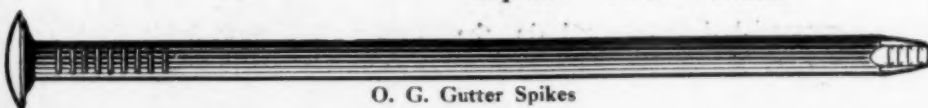
Flashing Hooks



Plain Sickle Hooks

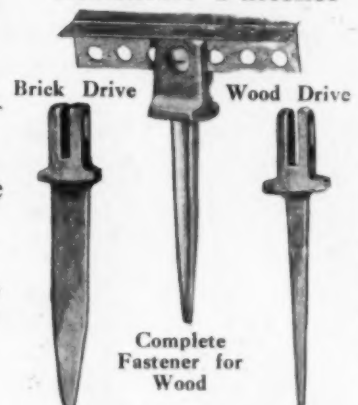
For Wood Also Plain Sickle Hooks for Brick

Square Wired Hooks



O. G. Gutter Spikes

### Osborn's Adjustable Conductor Fastener



Brick Drive

Wood Drive

Complete Fastener for Wood



Galvanized Ferrules

J. M. & L. A.  
**OSBORN CO**  
AND-BUFFALO  
d in Sheet Metal Work"

(Concluded from Page 61)

(4) The 2 per cent cash discount should be, and is, generally regarded as a legitimate item of cost just as raw material, labor, freight, etc., and should be always added as such by all mills and manufacturers.

(5) The reduction of the cash discount would reduce net profits of jobbers, which are now approaching the vanishing point. This can be definitely proven from reports compiled by our association.

(6) The reduction of the cash discount by the sheet metal mills would set an example for similar action by other groups of manufacturers.

(7) It would not be possible for jobbers of sheet steel, hardware and kindred lines to reduce their cash discount to  $\frac{1}{2}$  of 1 per cent to their trade for the reasons given in articles 1 and 2, and also because of the diversity of the lines distributed by them and competitive condition among the hundreds of distributors handling sheet steel whose territories overlap.

(8) We understand the chief contention of the mills in proposing the reduction of the 2 per cent cash discount is because they claim it is costing them 36 per cent. We wish to refute this statement and point out the fact that the only cost to them is the interest rate that they are compelled to pay on their accounts receivable, which is offset by the penalty of 2 per cent collected from those who do not discount.

(9) The jobbers can only figure 2 per cent on the number of turn-overs of their stocks, which average four times per annum, or 8 per cent of the amount invested in stock. The  $\frac{1}{2}$  of 1 per cent discount, if put into effect, will show the jobbers a loss of 6 per cent.

(10) The reduction of the cash discount will not only greatly increase accounts receivable, but will add to the cost of collection, which will affect both mills and jobbers.

Committee—

ROBERT H. LYON,  
A. W. HOWE,  
WALTER B. RICHARDS,  
WALTER DONLEVY.

### Modern Methods of Fabricating Bronze Screens

Copper wire cloth resists rust in most climates with entire success, but its strength is insufficient to give entirely satisfactory service. The use of bronze wire cloth, which is merely a strengthened copper, has been the solution of the problem of obtaining the right material for screens.

Then arose the problem of a permanent frame for a permanent screen material. A report from the International Acetylene Association, tells how this has been solved by the introduction and use of a frame fabricated from a material corresponding to the wire used in the cloth, the most satisfactory of these materials being what is known as commercial bronze and red brass. The former is an alloy of 90 per cent copper and 10 per cent zinc, and the latter is 85 per cent copper and 15 per cent zinc. Red brass, having a lighter color, finishes up to harmonize better with the cloth and also as a rule with the color of paint generally used on residences and apartment houses than the other.

Because red brass and commercial bronze contain zinc, it is difficult to make the joints by spot welding as can be done when galvanized iron or steel is used for the frame material. It, therefore, is necessary to use the oxy-acetylene process in welding these screen frames, and entire success in this work is made easily possible by using the smallest size welding torch, producing a flame having a cone about the size of a lead pencil point, and filler rods known as Tobin or manganese bronzes. These welding rods are alloys of copper and zinc, in each case of approximately 60 per cent copper and 40 per cent zinc. The alloys differ in that Tobin bronze contains 1 per cent tin, and manganese bronze 1 per cent each of iron and manganese. Being high in zinc as compared with the red brass and commercial bronze used in the frame materials, these welding rods melt at a much lower temperature so that in making the welds it is not

necessary to melt the red brass or commercial bronze but only to bring them up to a dull red heat and melt the Tobin and manganese bronze on the heated surface. A good brazing flux is essential in this work.

By following the foregoing suggestions, any good oxy-acetylene welder should be able to make neat and rapid work in the fabrication of permanent screen frames. When discoloration of the metal must be avoided these frames may have to be soldered instead of brazed or welded. A quick and neat job of soldering is possible by the use of the oxy-acetylene torch. Some manufacturers use dozens of oxy-acetylene torches in soldering with very great advantages over other forms of heat.

### What Is a Good Paint for a Tin Roof and Gutters?

An inquiry comes from Moser Brothers, Sabetha, Kansas, as follows: "What is considered the best paint for a tin roof and tin gutters? We do not refer to galvanized iron. Is a double lock gutter considered better than a single lock and soldered gutter?"

A good red lead paint applied after the roof has had time to weather would be considered proper. This would be a mixture of red lead and linseed oil.

Where the gutters are fastened by means of hangers the single lock and soldering would be considered the best practice. Where the gutter is laid in wood, single lock and soldering and cleating is the general practice. No nails are driven into the gutter itself, as the cleating provides for the free movement of the metal caused by expansion and contraction.

### Who Makes "Perfect" Clothesline Pulley?

TO AMERICAN ARTISAN:

Can you tell me who makes the "Perfect" clothesline pulley? They are used all over Oakland and San Francisco, California.

Very truly yours,

G. J. SMITH.



## Random Notes and Sketches

By Sidney Arnold

"The essence of humor is sensibility; warm, tender fellow-feeling with all forms of existence."—Carlyle.

Here's a letter from Arthur Stremel, President and Treasurer of Stremel Brothers Manufacturing Company, Minneapolis, Minnesota, in which he has made a very good stab at the identity of the man whose picture appeared on this page in the July 21st issue.

"In your issue of July 21st, I noticed on page 104 a picture which you had questioned. It looked rather familiar to me so I proceeded to go through my family album and found a picture that corresponded with it.

"If my memory serves me rightly, this is a photo of a well known 'Rauber Hauptman' from the opera Pinafore. You were right about his being a lady's man, as he certainly took that part well, stole hearts right and left, a regular 'Rauber Hauptman.' They say it was his eyes that attracted the ladies, but I am wondering if the curly mustache might not have had something to do with it."

I appreciate the trouble you were put to, Mr. Stremel, in your attempts at identification, but the man is now very high in sheet metal circles, although nature has changed his appearance somewhat, given him white hair and he no longer has the mustache.

\* \* \*

### Theological Wrangle

Hans Staar, Frank Staar & Sons, Inc., Chicago, was visiting a little Scotch community for the first time and was surprised to find two large Presbyterian churches facing each other on the main street. He sought enlightenment of a passing native.

"What was the reason for building two big churches of the same denomination in a place this size?" he asked. "Surely one would accommodate the entire village."

"Yes, you're right," admitted the citizen. "One would be plenty big enough, but there's two different classes of Presbyterians in this place

and so they had to have two churches."

"What's the difference in their religious views?"

"Well, so far as I can find out," drawled the native, "one bunch believes that Adam got bad after he ate that there apple, while the other bunch is convinced he was a darned rascal from the start."

\* \* \*

Below is a flattering portrait of Platte Overton, the self-styled H. L. Menken of the warm air heating industry. He was reared in the wild and wooly west after it had been tamed and was no longer wooly.



Platte Overton

A born doubter, he discontinued the prevailing idea of the day that every boy had a chance to become president and at the tender age of 18, inclined his ear to the call of the snips and mallet from which profession no presidents have sprung.

Recalls the days when furnaces were left to their fate over a hole in the floor that was supposed to be connected in some manner with the great open spaces. If the plant didn't work (which it never did) the client (patient) was informed that he wasn't firing properly.

Worked two years at the business before he was aware that ashes and sand were not placed on casing bon-

nets to keep the heat in. Still wondering why they are.

All fittings were made in the shop and tells with a straight face that he made 72-10" 3 piece elbows in 8 hours.

Left the hot air business to enter the warm air heating industry in 1907. Claims to be the only living heating man who never cut a "dutchman" in one joint of pipe to make it enter another.

Politics—An Al Smith Republican.

Favorite Color — Elephants breath.

Pet Peeves—Silk underwear for men and scientific fishermen.

Secret Ambition—to draw three cards and make a straight flush in a seven handed game with 6 pat hands out.

Favorite Actress — Aimee McPhearson.

Favorite Actor—Billy Sunday.

Favorite Book—Bank.

Favorite topic of conversation—We always let ours set two days before bottling.

Nationality and disposition — Scotch.

\* \* \*

Last week while I was on my vacation Charlie Biek of Rudy told John, my "substitute," a clever story about one of his Iowa dealers who had one of these "underbidding" competitors. This Rudy dealer posted quite an attractive sign in his window which read: "I have no quarrel with the man who sells his goods cheaper, for he *knows* what his goods are worth." By error the wording of the sign was incorrectly published.

\* \* \*

James Lawler, president of the Lawler Regulator Company, Mount Vernon, N. Y., passed through Chicago on Tuesday of this week and called us on the telephone. Mr. Lawler was an old friend of Daniel Stern, founder of AMERICAN ARTISAN. It was very kind of Mr. Lawler to call, and I am sorry that the time available to him did not permit him to pay us a personal visit.



Price-Cutting Furnace Installer Lays the Foundation for His Future Undoing by Pre-Meditated Trickery

## Price-Cutter Outwitted by Furnace Installer's Determination to Show Him Up

*One More Commercial Casualty Recorded When Builder Calls Installer to Deliver the Goods*

By GEORGE DUERR

**I**S the sale of sheet metal work and warm air heating equipment becoming more difficult? Warm air furnace installers are admonished by furnace salesmen and by various other media to sell health, comfort and convenience when approaching a furnace prospect, which is good logic.

It is a pretty tough proposition, however, to buck the kind of competition that is embodied in the price-cutting artist who not only attempts to overcome sales resistance by beating down the price, but who also leads the prospective customer to believe that he will give him a Standard Code job, which will insure him the same amount of health, comfort and convenience that the higher priced installation will produce for him.

### Can't Very Well Blame Prospect

The prospect reasons quite naturally, knowing nothing at all about the matter, that since he is going to get as much from one man as from the other and since the price of one man is lower than the other, he would be foolish indeed to put more money into the purchase of the

heating plant than is necessary to obtain the comfort desired; in fact, he gets the impression that one man is attempting to gyp him. In this he is correct, but he has the wrong man in mind.

To combat this type of competition where the prospect is of a little higher than average intelligence it is only necessary to draw attention to the difference in the type of transportation given by a high-priced and a low-priced car. They are both transportation but one is easy riding, dependable and a thing of beauty as well, while the other is transportation pure and simple and nothing else.

But on the other hand by far the largest majority of warm air heating plants today are not sold to the men to whom price looms large in comparison with comfort and greater health for instance. They are being sold to the man with whom price has great weight; in fact, to whom price overshadows almost every other consideration. If this were not true, the price-cutting sinner would not be able to make such large inroads upon the business that would under ordinary circumstances

fall to the man who is making an honest endeavor to get business at a price high enough to enable him to do the job right and to make a fair profit for his labors.

### Cracking the Cocoanut in the Right Manner

How then is the legitimate warm air furnace installer going to maneuver so as to bring the furnace prospect to a full realization of what he can expect from the price-cutter?

In order to show how this can be done, I am going to relate the experience of one warm air furnace installer, showing what he did when he lost a block contract for the installation of twenty furnaces in a row of bungalows.

In this case the price-cutter got in his licks in the usual way. He assured as a part of his sales appeal that the entire installation would be made in accordance with the Standard Code, knowing full well that at the price he would never be able to live up to the terms of the contract. His bluff, for that is all it could be called, was based entirely upon the builder's ignorance of the Standard Code, and the in-



staller took particular pains not to give the builder any more knowledge about it than he could help. He took the job, the builder thinking all of the while that the legitimate furnace installer, who had also bid on the job, was merely trying to cajole him into a higher price in order to take advantage of his lack of knowledge on the subject.

The fact that he had lost the job, together with the fact that he knew the kind of workmanship and materials the builder was going to get from the price-cutting artist, and, to do him honor, his pride and genuine interest in the warm air heating industry, caused this furnace installer to call upon the builder with the idea of showing him just what he could expect in the way of installations from the price-cutter. The builder, somewhat out of sorts, refused at first to listen and treated the matter as a closed incident.

#### The Brutal Awakening

But the furnace installer persisted and finally gained an audience.

His first question was, "Do you expect to get a Standard Furnace Code installation at the price at which these jobs were taken?"

"Those are the terms of the contract," replied the builder somewhat airily.

"Do you know what the Standard Code is and would you yourself be able to discern the difference between a Standard Code installation and one that is not strictly up to the

standard required by the Code?" continued the installer undismayed by the hostile and patronizing attitude of the builder.

"Well, er, that is, no, I don't think I would," replied the builder, somewhat taken aback by the calm assurance of the contractor, who stood undaunted before him, and yet surprised that he could have been tricked so easily by the price-cutter, for by this time he had an inkling of the trap into which he had fallen.

"Would you like to know how you can figure the thing out for yourself so that you can be sure that the contractor who is making these installations is carrying out the terms of the contracts to the letter?" the contractor went on, seeing by the changed expression on the builder's face that he had won a point. "You know there is a big chance for 'intentional error' in a contract calling for the installation of twenty furnaces."

"Yes, indeed, I would like to know how I can make this check," said the builder, now all alert and eagerly drinking in each word let fall by the contractor as though they represented the elixir of life to him.

"Well, even though I did not get this job," said the contractor, "I have the interests of the industry too much at heart to allow these jobs to go in in the manner which I know they will go in if the man who is going to put them in is not carefully checked. His price is too

low for him to put in the jobs in accordance with the Standard Code requirements."

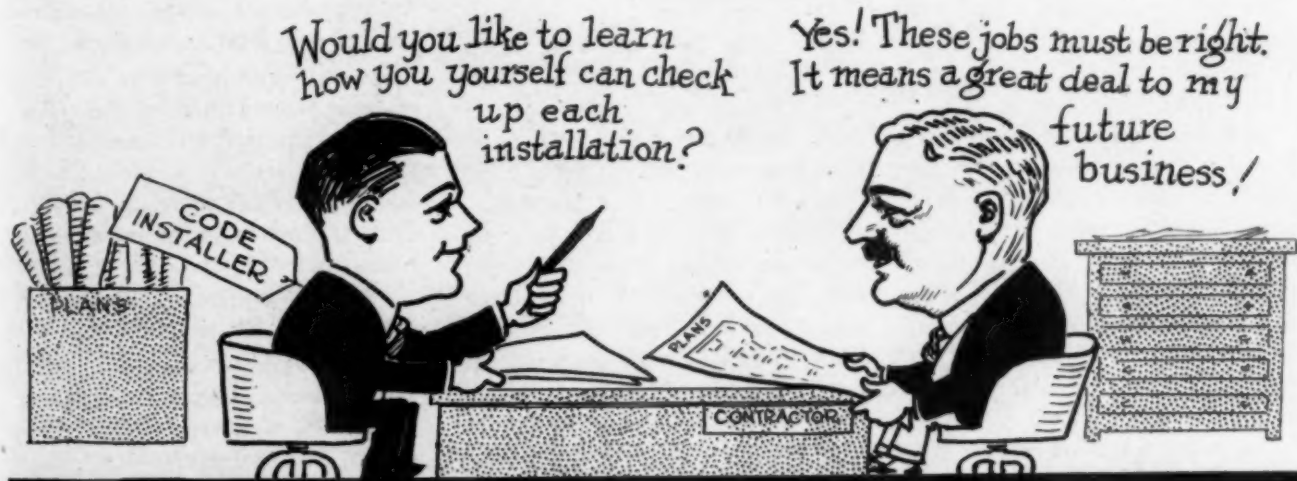
#### And Then the Screws Were Applied

"But what do you suggest that I do to insure myself?" interrupted the builder. "I want to sell these buildings and I want them to be right in every respect before they are turned over to their ultimate owners. It means a great deal to my future business."

"Here is a copy of the Standard Code," said the contractor taking one from his brief case and laying it on the table before the builder, while at the same time he drew up a chair and took out paper and pencil.

In one hour's time he had explained the application of the Standard Furnace Code in every detail to the astonished builder, thus arming the builder with a weapon more deadly to the price-cutter than any other that he could possibly have employed.

With his interest thoroughly aroused in the Standard Code method of installing warm air furnaces and with a grim determination to see that the price-cutting contractor lived up to the letter of the contract in every detail, the builder proceeded to make life miserable for the poor price-cutter. He hounded him daily, calling him to account for every omission, and these were only too numerous. He made it his



Code Warm Air Furnace Installer Whose Pride in the Industry of Which He Is Part Encouraged Him to Put the Owner on His Guard



business to see to it that the proper sized furnace went into each and every job. He was ruthless in his determination to see that each furnace was supplied with sufficient cold air, a point upon which the legitimate contractor had bid him be on the lookout for shortcomings.

The upshot of the whole matter was that, although the contractor who had asked a fair price for his work did not get the job, he put information in the hands of a very influential builder concerning the warm air heating system and how it should be installed to get the best results that put one price-cutter so badly out of the running that he retired from the furnace installing business sadder but wiser and went to work for one of his former competitors. It was a hard pill to have to administer, but the deserving one got it to the full, and he was brought to a full realization of his shortcomings and knew that he had received his just deserts.

#### Ringin' Down the Curtain on One Installer

Had the contractor who lost the job been less enterprising and had he had the interests of the warm air heating industry less at heart, these twenty furnace jobs would have gone in in a slipshod manner. The installer who put them in would have been paid his money and gone merrily on his way rejoicing in the knowledge that he had put over quite a slick trick and looking for more worlds to conquer.

The builder would have been left with the impression that a furnace man had tried to gyp him and whom he had outwitted in return.

But the real sufferers would have been the innocent buyers of the homes into which the furnaces were installed and the warm air heating industry in general. For, assuming that each family would consist of at least four, there would have been eighty voices more crying out in protest of the unserviceability of the warm air heating system.

Yes, selling warm air heating systems on a basis that will allow proper installation and a fair profit to the installer is becoming more dif-

ficult. On the other hand, the men who are combating the price-cutting evil are profiting by their experiences. Their wits are becoming sharpened and this added to the fact that they have right on their side is showing them the way to triumph in the end.

The gospel of the Standard Code must be spread far and wide to the end that the price-cutter will be unable to cajole the unsuspecting into falling for the price talk.

#### PROGRESS IN HEATING

In the AMERICAN ARTISAN of May 19, 1928, you had a piece showing progress in the heating industry by putting pep into the coal. In another paper I see how the oil man has pepped up his oil some. It says a man in Cleveland had a twenty-eight room Manshun and he fixed up some kind of a jigger of his own and bought a couple of fans and heated his manshun with 800 gallons of oil. An I sez to myself "That's goin' sum." So I ast Prof. Splitpinsel to figure how about it. He sez to me, "Ef that there manshun has just little bitta rooms it will take 5,000 B.t.u. (whatever that is) fur ever dod-gasted room an that makes and takes says he 140,000 of them B.t.u. things when it is zero cold. En then he sez. It don't stay zero cold all the time. He sez it see saws up and down around 35 degrees, and so he sez it only takes half of the 140,000 B.t.u. things or 70,000. But listen. He says that is fur only just one little hour. An there is 6,312 heatin' hours in Cleveland and so he figures that the twenty-eight little room manshun takes 441,840,000 B.t.u. things in a winter. Just like that.

Then he whittled a new point on to his pensel and starts in on that oil. He sez Ef it is hevy black sticky oil like gets stiff in cold wether and stinks all the time that every gallon would have 141,700 of them B.t.u. things and 800 gallons would have 113,360,000 of the B.t.u. stuff and there I begin to see what he is gettin' at. If you divide the B.t.u.'s in the oil into the B.t.u.'s in

the twenty-eight little rumes sez he, you can tell how often he has to burn the 800 gallons over and over to ekal the heat the manshun needs. So 441,840,000 divided by 113,360,000 ekels purty near four times he must burn that oil over and over again to keep warm.

En then the perfesser says that don't call fur no loss. It's 100 per cent efficient ever time it burns. En burnin' it nearly four times makes it nearly 400 per cent efficient.

I think the oil man is giving your coal man a close race. May the best man win. I. M. CREDULOUS.

#### M. D. Hussie, Brother of the John H., Dies After Protracted Illness

M. D. Hussie, Omaha, Nebraska, brother of the late John H. Hussie, died recently after an illness that had kept him confined for more than a year. Previous to that time the condition of his health had been such as not only to occasion discontinuance of his hardware association activities, but to necessitate his retirement from the hardware business of which he had been a part for more than forty years.

Mr. Hussie had taken a very active part in the National Retail Hardware Association doings and was president of that organization during the term of 1918-1919, and was as much of a figure in hardware circles as his brother, the late John H. Hussie, was in the warm air heating and sheet metal circles.

He and his brother were associated with their father in the John Hussie Hardware Company, of Omaha, a business which throughout the forty-five years has been located at Twenty-fourth and Cuming Streets. It still is operated under the original firm style, although no longer in the Hussie family.

The widow, a daughter, Mrs. James Martin, Omaha, and three grandchildren survive; also three sisters, Mrs. James Atwood, Santa Monica, California; Mrs. Manuel Questa, Barcelona, Spain, and Mrs. Howard Miller, Waterloo, Iowa.

# Air Analysis for Ventilation as Applied to Hot Blast Heating

## Air Requirement for Ventilation in Workshops Computed

By T. W. TORR, Heating Engineer Rudy Furnace Company

### Chapter IX

IT is the generally accepted rule that good ventilation consists in supplying 30 cubic feet per person occupying the room per minute and that an equal quantity of air be exhausted from the room. This conclusion has been arrived at in the following manner.

Pure air contains as follows:

Oxygen .....	20.26
Nitrogen .....	78.00
Carbon Dioxide (CO <sub>2</sub> )..	0.04
Water Vapor .....	1.50

Air exhaled from the lungs will contain:

Oxygen .....	16.2
Nitrogen .....	75.0
Carbon Dioxide (CO <sub>2</sub> )...	4.0
Water Vapor .....	5.0

The water vapor content will vary slightly according to conditions. The expired air leaves the lungs at from 90 to 98° F., will be nearly saturated with water vapor and will be somewhat lighter than when inhaled, possibly 1 to 3 per cent.

Air taken into the lungs will give up some oxygen and nitrogen, but the greatest change will be in the increase of CO<sub>2</sub> in the exhaled air. This increase is about 100 times, or from 4 parts in 10,000 in pure air to 400 parts in 10,000 as exhaled from the lungs.

The diffusion of exhaled air through the room takes place at once and is quite general, thereby increasing the CO<sub>2</sub> content of the room air above 4 parts in 10,000. When the CO<sub>2</sub> content due to respiration exceeds 7 parts in 10,000, the effect of poor ventilation is quite noticeable. At 10 parts in 10,000 actual discomfort is experienced.

In a well designed ventilating system it is customary to limit the

increase in CO<sub>2</sub> in parts per 10,000 above that of outside air to from 2 to 3. The cubic feet of outside air to be supplied per person in order to maintain such a standard can be figured as follows:

An adult at rest requires about 20 cu. in. of air at each respiration, and will make from 16 to 24 respirations per minute. A total of 320 or 480 cu. in. of air are required per minute, or about 0.25 of a cubic foot. Since the exhaled air contains 400 parts CO<sub>2</sub> per 10,000 an adult at rest will give off —  $0.25 \times 60 \times 0.04 = 0.6$  cu. ft. of CO<sub>2</sub> per hour.

We must, therefore, supply for each person a certain number of cubic feet of outside air per minute, containing 4 parts CO<sub>2</sub> to 10,000 so the inside air will not go above 7 parts CO<sub>2</sub>.

It has been found that an adult will inhale about 0.25 cu. ft. of air per minute which when exhaled will contain 400 parts CO<sub>2</sub> to 10,000. The air in the room is not to exceed 7 parts CO<sub>2</sub> to 10,000 and this condition is maintained by introducing outside air with a content of 4 parts CO<sub>2</sub> to 10,000.

The cubic feet of outside air to be introduced per person is found by multiplying:  $400 \times 0.25$ , and dividing that result by  $7 - 4$ .

$$400 \times 0.25$$

————— = 33.3 cu. ft of outside air per minute. → 30 cu. ft. is generally used in practice.

Supplying 30 cu. ft. per minute per person is just one phase of ventilation. There may be odors, dust or harmful gases to be removed. There is humidity and other forms of air conditioning that come under the head of ventilating. These are

all special problems and require individual treatment.

### Chapter X

In Chapter III we determined the volume of air to be recirculated in a building from which the heat loss was 320,000 B. T. U. per hour, the temperature rise was 75°, from 65° to 140°. This volume was found to be 4,000 cu. ft. per minute.

Let us now assume there will be 50 men employed and it is necessary to provide 30 cu. ft. per minute for each man. We must first find the pounds of fresh air for ventilation and reduce it to cu. ft. per minute.

Pounds of air to be recirculated per minute for ventilation at 70° =  $.075 \times 30 \times 50 \times 13.5 = 1,518.75$  C. F. M. Call it 1,500 C. F. M., in which

.075 = weight of cu. ft. of air at 70°,

30 = cu. ft. air per minute per person,

50 = men occupying building,

13.5 = cu. ft. in pound of air.

We have already determined that we would circulate 4,000 C. F. M. all from the inside;  $4,000 - 1,500 = 2,500$ , or the mixture will be 2,500 C. F. M. inside air and 1,500 C. F. M. outside air.

2,500 C. F. M. @ 65° =  $2,500 \times .07567 = 189.175$  lbs. per min.

1,500 C. F. M. @ 0° =  $1,500 \times .08636 = 129.54$  lbs. per min.

We now multiply the pounds per minute by the degree of temperature at which it will enter the mixing chamber, giving degrees per pound. This result divided by the total pounds gives the temperature of the mixture.

$$\frac{190 \times 525 + 130 \times 460}{190 + 130} - 460 = 38.6^\circ$$

Using the absolute temperature was not necessary in this case, but if the outside temperature had been



below zero it would have to enter into the calculation.

We now find we have to circulate 320 pounds of air per minute at a temperature rise of  $140 - 38 = 102^\circ$ .

The B. T. U.'s required per hour will be  $320 \times 60 \times .24 \times 102 = 470,016$  B. T. U.'s.

We will now have to provide a heating unit having a capacity that will produce 470,000 B. T. U. per hour. In other words, it takes 320,000 B. T. U. per hour to compensate for heat losses and 150,000 B. T. U. per hour for ventilation.

Let us increase the number of workmen to 70 and see how many pounds of air per hour we will have to handle.

$.075 \times 30 \times 70 \times 60 = 9,450$  pounds per hour. As this is nearly half the amount of recirculated air and the temperature for the outside air is from  $0^\circ$  to  $140^\circ$ , or more than twice the mean room temperature, we know the ventilation requirements are going to approximately equal our total heat losses.

$9,450 \times .24 \times 140 = 317,520$  B. T. U. required for ventilation.

It is easy to see that ventilation is quite a problem and the requirements can very easily exceed the heat losses.

In the case we have just figured the addition of one more man would just about bring them up to the heat losses.

It would take the capacity of one Rudy "Giant" to restore the heat losses and another one to provide heat for ventilation.

#### How Can Mr. Anderson Eliminate This Noise?

TO AMERICAN ARTISAN:

One of my customers is having trouble with a small exhaust, being only 4" and making so much noise.

What I would like to know is how to make one that will eliminate the noise and release the press quickly.

The 8" exhaust works O. K. The only trouble is in the smaller one.

Yours truly,  
E. E. ANDERSON.

#### Colburn Heater Company Producing New Heater in New Plant

The Colburn Heater Company, Chicago, Illinois, announces production in all sizes of their new improved Colburn steel heater.

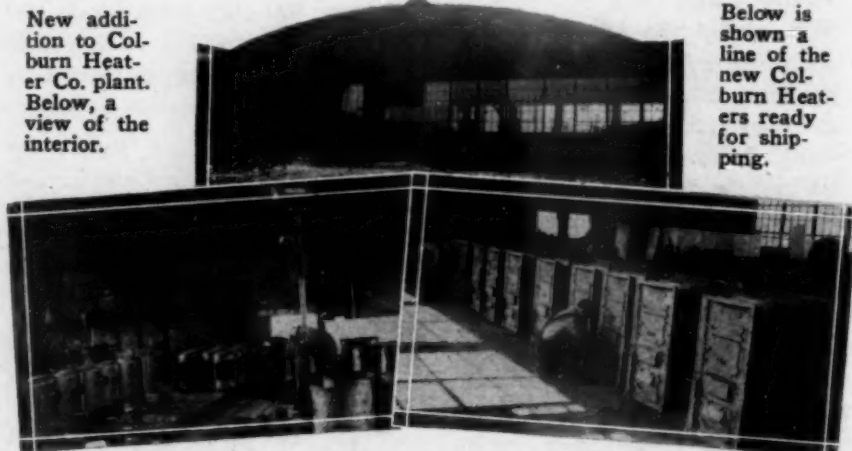
A new addition to their plant is aiding production, providing increased manufacturing facilities and additional storage room.

The new building is equipped with new machinery of an improved type and a new welding room.

Of modern construction the recently built addition runs one hundred feet in length by eighty feet wide. Huge skylights and windows extending the full length of the building on either side provide abundance of light and air.

The company states that upwards

New addition to Colburn Heater Co. plant. Below, a view of the interior.



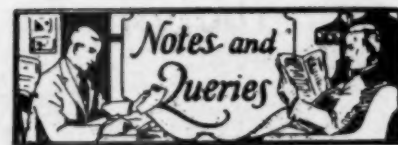
Below is shown a line of the new Colburn Heaters ready for shipping.

of two hundred furnaces can now be stocked on its premises.

The improved Colburn heater has electric welded all steel separate pouches. The front is cast iron and the method of fastening is claimed to be an exclusive feature. It is stated by the company that the new construction besides being an improvement in air tight construction also enables easier and quicker fastening of the front to the furnace.

The cleanout collar is also welded steel.

The company states that other improvements have been made and that literature on this new furnace is now ready and can be obtained by addressing the Colburn Heater Company, 1954 North Long Avenue, Chicago, Illinois.



#### "Maltese Cross" Water Heater

From Security Stove and Mfg. Co., Kansas City, Missouri.

Can you tell us who makes the No. 15 Maltese Cross water heater for use in a warm air heater?

Ans.—Chas. Smith Company, 6143 Wentworth Ave., Chicago.

#### "Zephyr" Washed Air System

From Bechtel & Wetzel, 277 West Columbia Street, Marion, Ohio.

Please tell us who makes the Zephyr Washed Air System.

Ans.—Zephyr Washed Air Company of Minneapolis, Minnesota, manufacture this system. However,

Hart and Crouse Company, Utica, New York, are the exclusive distributors.

#### Advertising Cuts

From W. E. Hershberger and Sons, Marshall, Missouri.

Where can we buy cuts for sheet metal and furnace newspaper advertisements?

Ans.—Advertising Art Service, Meriden, Connecticut.

#### Boiler Casting

From John R. Sweet, 1209 Washington Avenue, Wilmette, Illinois.

Where can I get a casting belonging to a boiler made by the Noble Iron Company of Canton, Ohio?

Ans.—This was taken over by the National Radiator Corporation, 2445 North Keeler Avenue, Chicago, who can supply the casting.



## Steel and Iron Prices Tend to Strengthen

### Non-Ferrous Business Large During Week—All Metals Well Booked

**T**HE most important development in the iron and steel trade in recent weeks has been the strengthening tendency of prices.

At the beginning of August the composite average stood at \$34.89 a ton. This compared with \$35.23 in January and with \$36.25 one year before. The level of iron and steel prices at the August low was only 32 per cent over the 1913 average. Actually it was the lowest point reached since 1916, except for a few months in the depression years of 1921 and 1922.

There are many indications that prices of iron and steel have fallen too far. In the first place they are out of line with all industrial prices, which stand about 50 per cent over the 1913 level. Secondly, earnings of iron and steel companies, at about 5 per cent on invested capital, have been notoriously low despite large volumes of output.

There seems now to be a better understanding on the part of steel consumers that prices have been too low. This is helping to lessen some of the resistance against reasonable advances. The most important factor, however, is that demand has expanded on a large scale. In some lines the productive facilities of the mills are being taxed to the limit to supply needs of the consumers.

#### Copper

Copper sold in the past week in good tonnage for domestic shipment. October buying was active for the first time. Some September business was done and a little November coupled with October.

Producers are well booked for September and shipments this month will be in a tight situation. Export buying eased up after having been active for September and October.

Prices are unchanged at 14.75 cents; Connecticut, 14.87½ cents; Midwest, 15 cents.

#### Tin

Tin was moderately active nearly every day. The bulk of the business was in early positions, with some over the rest of the year.

Users appear to have needed more than they had expected and were forced to buy nearby metal, with the result that such continued to command a big premium, more than 1 cent above the late months of the year.

Domestic deliveries of 7,200 tons were made in August, a figure seldom exceeded and about 1,000 tons over the monthly average of the past year and a half. Stocks and landing were 1,718 tons, a cut of 1,160 in the month. Stocks alone were large, but the amount in landing was small.

Spot and nearby command a big premium despite large stocks, because of the fact that nearly all metal here is held by one large importer.

#### Lead

Buying of lead in the past week was large again and prices were strong but unchanged, except for a little premium on East St. Louis October lead.

#### Zinc

Prime western continues quiet, but producers remain firm at 6.25 cents, East St. Louis, which price has ruled for a month on all positions.

#### Pig Iron

Sentiment in the Pittsburgh pig iron market has improved considerably, with all sellers talking higher prices.

Demand for foundry iron has broadened and inquiry is slightly more active. A gradual upturn in the melt is noted in this district.

Some inquiries are out involving up to 1,000 tons. Sellers are taking a firmer attitude at \$17, valley, for No. 2 foundry, while \$16.50 has practically disappeared. Some sales are reported at \$16.75.

Specifications are satisfactory, some requests being received for rush shipment. Stocks of a number of melters are low. Bessemer iron is stronger.

Pig iron merchant stocks in Chicago have been materially reduced by recent increases in shipments and the heavy buying movement of the past four weeks.

Two merchant furnaces probably will be blown in soon, No. 4 Iroquois stack at the end of this week and the second Federal stack to resume when repairs are completed within ten days. This will make all available merchant stacks active for the first time in many months.

It is estimated August sales of foundry and malleable iron were from 250,000 to 300,000 tons. Both July and August were record sales months in this district. Individual buying recently is considered conservative.

Many melters, however, covered for the remainder of the year before the price was advanced to \$18, base, furnace.

Birmingham foundry iron is being sold fairly well at the advanced prices. Only one consumer has intimated it has decreased its melt, while several others are melting steadily, with expectations of continuing for some time.

Furnace interests are selling through the remainder of the year at \$16.25, base, Birmingham.

#### Old Metals

Wholesale quotations in the Chicago district, which should be considered as nominal, are as follows: Old steel axles, \$16.00 to \$16.25; old iron axles, \$24.00 to \$24.50; steel springs, \$15.50 to \$16.00; No. 1 wrought iron, \$11.50 to \$12.00; No. 1 cast, \$13.00 to \$13.50; all per net tons. Prices on non-ferrous metals are quoted as follows, per pound: Light copper, 10¼ cents; zinc, 3¼ cents; cast aluminum, 11¼ cents.

# Chicago Warehouse Metal and Furnace Supply Prices

AMERICAN ARTISAN is the only publication containing Western Metal, Furnace Supply and Hardware prices corrected weekly

## METALS

### PIG IRON

Chicago Fdy.	
No. 2	\$18 00
Southern Fdy. No. 2	22 26
ak. Superior Charcoal	27 04
Malleable	18 00

### FIRST QUALITY BRIGHT TIN PLATES

IC	20x28 112 sheets	\$25 10
IX	20x28	29 40
IXX	20x28 56 sheets	16 20
IXXX	20x28	17 55
IXXXX	20x28	18 35

### TERNE PLATES

IC	20x28, 40-lb. 112 sheets	\$26 00
IX	20x28, 40-lb. 112 sheets	27 75
IC	20x28, 35-lb. 112 sheets	21 15
IX	20x28, 35-lb. 112 sheets	23 80
IC	20x28, 30-lb. 112 sheets	19 55
IV	20x28, 20-lb. 112 sheets	22 05
IC	20x28, 15-lb. 112 sheets	18 05

### "ARMCO" INGOT IRON PLATES

No. 8 ga. up to and including	
1/4 in.—100 lbs.	\$4 55

### COKE PLATES

Cokes, 80 lbs., base, 20x28	\$13 00
Cokes, 90 lbs., base, 20x28	13 80
Cokes, 100 lbs., base, 20x28	14 00
Cokes, 107 lbs., base, IC	
20x28	14 30
Cokes, 135 lbs., base, IX	
20x28	16 40
Cokes, 155 lbs., base, 56	
sheets	9 30
Cokes, 175 lbs., base, 56	
sheets	10 05
Cokes, 195 lbs., base, 56	
sheets	10 90

### BLUE ANNEALED SHEETS

Base 10 ga. up to and including	\$3 35
"Armco" 10 ga. per 100 lbs.	4 00

### ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs.	\$3 60
No. 22	per 100 lbs.	3 75
No. 24	per 100 lbs.	3 80
No. 26	per 100 lbs.	3 90
No. 27	per 100 lbs.	3 95
No. 28	per 100 lbs.	4 05
No. 29	per 100 lbs.	4 20
No. 30	per 100 lbs.	4 30

### "ARMCO" GALVANIZED

"Armco" 24	per 100 lbs.	\$6 15
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### GALVANIZED

No. 16	per 100 lbs.	\$4 15
No. 18	per 100 lbs.	4 30
No. 20	per 100 lbs.	4 45
No. 22	per 100 lbs.	4 55
No. 24	per 100 lbs.	4 65
No. 26	per 100 lbs.	4 90
No. 27	per 100 lbs.	5 00
No. 28	per 100 lbs.	5 15
No. 30	per 100 lbs.	5 55

### BAR SOLDER

Warranted		
50-50	.....per 100 lbs.	\$30 75
Commercial		
45-55	.....per 100 lbs.	27 25
Plumbers	...per 100 lbs.	24 25

### ZINC

In Slabs	\$ 8 50
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### SHEET ZINC

Cask Lots (600 lbs.)	\$11 25
Sheet Lots	12 25

### BRASS

Sheets, Chicago Base	19 1/2c
Mill base	18 1/2c
Tubing, brazed base	27 1/2c
Wire, base	18 1/2c
Rods, base	16 1/2c

### COPPER

Sheets, Chicago base	24 1/2c
Mill base	23 1/2c
Tubing, seamless base	26 1/2c
Wire, No. 9, B & S Ga.	19 1/2c
Wire, No. 10, B & S Ga.	19 1/2c
Wire, No. 11, B & S Ga.	20 1/2c
Wire No. 3, B & S Ga. and heavier	

### LEAD

American Pig	\$7 20
Bar	\$ 20

### TIN

Pig Tin	per 100 lbs.	\$55 00
Bar Tin	per 100 lbs.	\$6 00

## HARDWARE, SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES.

### ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	6 1/2c per lb.
Mill board 3/32 to 1/2	6c per lb.
Corrugated Paper (250 sq. ft. to roll)	\$4 00 per roll

### BRUSHES

Furnace Pipe Cleaning	
Bristle, with handle, each	\$0 75

### Flue Cleaning

Steel only, each	1 25
------------------	------

### BURRS

Copper Burrs only	40-2 1/2%
-------------------	-----------

### CEMENT, FURNACE

American Seal, 5-lb. cans, net	\$ 45
American Seal, 10-lb. cans, net	82
American Seal, 35-lb. cans, net	2 25
Pecora	per 100 lbs. 7 50

### CHIMNEY TOPS

Adams' Revolving	
Wt. Doz. Price Doz.	
4 in.	21 lbs. \$11 00
6 in.	24 lbs. 11 50
7 in.	30 lbs. 13 50
8 in.	33 lbs. 15 00
9 in.	51 lbs. 16 50
10 in.	56 lbs. 18 00
12 in.	66 lbs. 22 00
14 in.	110 lbs. 26 00

### CLINKER TONGS

Each	\$1 50
------	--------

### CLIPS

Damper	
No-Rivet Steel, with tall pieces, per gross	\$9 50
Rivet Steel, with tall pieces, per gross	7 50
Tall pieces, per gross	2 40

### COPPERS—Soldering

Pointed Roofing	
3 lb. and heavier	per lb. 40c
2 1/2 lb.	per lb. 45c
2 lb.	per lb. 48c
1 1/2 lb.	per lb. 55c
1 lb.	per lb. 60c

### CORNICE BRAKES

Chicago Steel Bending	
Nos. 1 to 6B	Net

### CUT-OFFS

Gal. plain, round or cor. rd.	
26 gauge	30%
28 gauge	35%

### DAMPERS

"Yankee" Hot Air	
7 inch, each 20c, doz.	\$1 50
8 inch, each 25c, doz.	2 20
9 inch, each 30c, doz.	2 60
10 inch, each 32c, doz.	2 80
Smoke Pipe	
7 inch, doz.	\$1 60
8 inch, doz.	2 20
9 inch, doz.	2 60
10 inch, doz.	2 75
12 inch, doz.	4 50

### ADAMS No. 1 CHECK

Check and Collar Complete	2 00
9 inch, each	2 25
End Check Only	
8 inch, each	1 60
9 inch, each	1 85

### Collar Only

8 inch, each	50
9 inch, each	65

### No. 2 CHECK

8 inch, each	1 00
9 inch, each	1 00

### 10% Disc. on Adams No. 1 and No. 2 Check

Diamond Smoke Pipe	
7 inch, doz.	\$ 2 00
8 inch, doz.	2 30
9 inch, doz.	4 80
10 inch, doz.	

### Adams' Sheet Metal

7 inch, doz.	\$ 1 60
8 inch, doz.	2 20
9 inch, doz.	2 60
10 inch, doz.	2 80
12 inch, doz.	3 50
14 inch, doz.	5 00

### EAVES TROUGH

Galv. Crimpedge, crated 75 & 10%	
Zinc, "Barnes"	60%

### ELBOWS

Conductor Pipe	
Galv. plain or corrugated, round flat Crimp.	
28 Gauge	60%
26 Gauge	45%
24 Gauge	15%

### Galv. & Terne Steel

Plain Rd. and Rd. Corr.	
28 Ga.	60%
26 Ga.	45%
24 Ga.	15%

### Square Corrugated

No. 28 Gauge	50%
26 Gauge	35%

### Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.	
Not nested	70 & 5%
Nested Solid	70 & 5%

### Sq. Corr., A. & B. & Octagon

28 Ga.	50%
26 Ga.	35%

### Portico

1", 1 1/4", 1 1/2"	45%
--------------------	-----

### Copper

16 oz., all designs	50%
---------------------	-----

### Zinc

All styles	60%
------------	-----

### ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue	
"Milcor" No. 28 Gauge, Doz.	
5-inch	\$1 05
6-inch	1 20
7-inch	1 75

### Special Corrugated

6-inch	\$1 00
7-inch	1 60

### Adjustable—Uniform Blue

"Milcor" No. 28 Gauge, Uniform Blue.	
5-inch	\$1 65
6-inch	1 75
7-inch	2 10

### WOOD FACES—50% off list.

### FENCE

726-6-12 1/4% (100 rods)	\$28 65
1948-6-14 1/4% (100 rods)	43 62

### FILES AND RASPS

Heller's (American)	50-10%
American	60-10%
Arcade	50%
Black Diamond	50%
Eagle	50%
Great Western	50%
Kearney & Foot	50%
McClellan	50%
Nicholson	50%
Simonds	60%

### FIRE POTS

Geo. W. Diener Mfg. Co.	Es.
No. 02 Gasoline Torch, 1 qt.	\$ 13
No. 0250, Kerosene, or Gasoline Torch, 1 qt.	6 50
No. 10 Tinner's Furn. Square tank, 1 gal.	11 20
No. 15 Tinner's Furn. Round tank, 1 gal.	10 70
No. 21 Gas Soldering Furnace	2 00
No. 110 Automatic Gas Soldering Furnace	10 50

### Quick Meal Stove Co.

Vesuvius, F. O. B. St. Louis 30%	
(Extra Disc. for large quantities.)	

### GALVANIZED WARE

Pails (Galv. after made), 10-qt.	\$2 00
Tubs (Galv. after made), No. 1	5 75
No. 2	6 50

### GLASS

Single Strength, A, 52-in. brackets	88%
Single Strength, 9, 34 to 40-in. brackets	88%
Single Strength, A, all other brackets	88%
Double Strength, A, all sizes	89-5%

### HANGERS

Conductor Pipe	
Milcor Perfection Wire	25%
Milcor Triplex Wire	10%

### Eaves Trough

Milcor Steel (galv. after forming) List	plus 12 1/2%
Milcor Seisock E. T. Wire, List	plus 50%

### HOOKS

Conductor	
"Direct Drive" Wrought Iron for wood or brick	15%

### HUMIDIFIER

"Front-Rank," Automatic	
In single lots	50%
In lots of 10 or more	50-5%
In lots of 25 or more	50-10%
Vapor pans, etc., each	50%

### LIFTERS

Stove Cover	
Coppered	per gro. \$6 00
Alaska	per gro. 4 75

### MALLETS

Tinners	
Hickory	per doz. \$3 25

### MITRES

Galvanized steel mitres,	
28 Ga.	70
26 Ga.	60-20

### NAILS

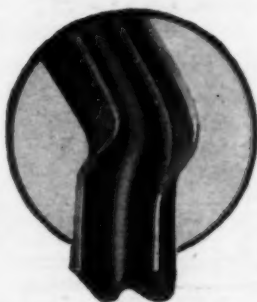
Cut Steel	\$4 25
Cut Iron	4 25

### Wire

Common	\$3 10
Cement Coated	3 10

(Continued on Page 74)

The double channel in the bend of the shank increases the strength 90 per cent over any other type of No. 12 Shank



This bead clip holds the gutter absolutely tight without solder and is Udyllite rust proof coated—no raw edges to rust out and fail you in a few years



Here's the lock of security. The Circle cannot loosen and sag the gutter, even though the bolt through the Shank becomes loose. All the weight is taken by the Shank

**THIS  
NEW**

# Lupton<sup>M</sup><sub>R</sub> HANGER, CARRIES THE LOAD!

**S**HEET metal men tell us the new Lupton M-R Hanger is the best they've ever used.

The outstanding characteristics of this Shank and Circle are its strength and convenience—both the result of correct design. Note the three long bearing surfaces where Circle joins Shank. The bolt serves only to connect the two, while the load is carried by the contact of the bearing surfaces. Gutter hung on M-R Hangers will withstand any load of water, ice, or snow that can fall onto it and, the heavier the load the more rigid the Hangers become. The rust-proofed bead clips used with M-R Hangers ensure a tight, neat job without soldering and with a considerable saving of labor.

Lupton Shanks and Circles run absolutely uniform in size and are made in single or double bead Circles; all types of Shanks in plain Steel, Udyllite Rustproof Coated Steel and Copper. You can get Lupton Hangers from your jobber. Try them out on your next job.

DAVID LUPTON'S SONS COMPANY  
Allegheny Ave. & Tulip St., Philadelphia



Patent  
Applied  
For



## ADVERTISERS' INDEX

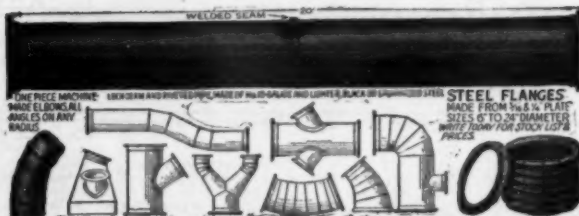
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PASTE	RIDGE ROLL
Asbestos Dry Paste:	Galv. Plain Ridge Roll, b'd'd ..... 75-15-5%
200-lb. Barrel ..... \$16 00	Galv. Plain Ridge Roll crated ..... 75-15%
100-lb. barrel ..... 8 75	Globe Finials for Ridge Roll. 50%
35-lb. pall ..... 3 50	
10-lb. bag ..... 1 10	
5-lb. bag ..... 60	
2½-lb. cartons ..... 25	
POKERS, FURNACE	SCREWS
Each ..... \$0 75	Sheet Metal
	7. ½x¼, per gross ..... \$0 52
<b>POKERS, STOVE</b>	No. 10, ¾x3/16, per gross 68
Nickel Plated, coil handles, per doz. .... 1 10	No. 14, ¾x¼, per gross. 88
Wrt Steel, str't or bent, per doz. .... \$0 75	
PIPE	SHEARS, TINNERS' & MACHINISTS'
Conductor	Viking ..... \$22 00
Cor. Rd., Plain Rd., or Sq.	Lennox Throatless
Galvanized	No. 18 ..... 35%
Crated and nested (all gauges) ..... 75-7½%	Shear blades ..... 10%
Crated and not nested (all gauges) ..... 75-2½%	(f. ex b. Marshalltown, Iowa)
Furnace Pipe	SHIELDS, ADJUSTABLE RADIATOR
Double Wall Pipe and Fittings ..... 50%	No. 1 "Gem" 11" to 17" ..... 30%
Single Wall Pipe, Round	No. 2 "Gem" 14" to 24" ..... 30%
Galvanized Pipe ..... 50%	No. 3 "Gem" 35" to 65" ..... 30%
Galvanized and Tin Fittings ..... 50%	
Lead	<b>SHOES</b>
Per 100 lbs. .... \$12 50	Galv. 28 Gauge, Plain or corrugated round flat crimp. .... 60%
<b>Stove Pipe</b>	26 gauge round flat crimp. .... 45%
"Milcor" "Titelock" Uniform Blue Stove	24 gauge round flat crimp. .... 15%
28 gauge, 5 inch U. C. nested ..... 10 50	
28 gauge, 6 inch U. C. nested ..... 11 00	<b>SNIPS, TINNERS</b>
28 gauge, 7 inch U. C. nested ..... 13 00	Clover Leaf ..... 40 & 10%
30 gauge, 5 inch U. C. nested ..... 9 00	National ..... 40 & 10%
30 gauge, 6 inch U. C. nested ..... 10 00	Star ..... 50%
30 gauge, 7 inch U. C. nested ..... 12 00	Milcor ..... Net
<b>T-Joint Made up</b>	<b>SQUARES</b>
8-inch, 28 ga. .... per doz. \$ 4 00	Steel and Iron ..... Net
	(Add for bluing \$3 per doz. net)
<b>All Zinc</b>	Mitre ..... Net
No. 11, all styles. .... 60%	Try ..... Net
	Try and Bevel. .... Net
<b>PULLEYS</b>	Try and Mitre. .... Net
Furnace Tackle. .... per doz. \$0 25	Fox's ..... per doz. \$6 00
Plated, 4x8 to 14x14. .... 40%	Winterbottom's ..... 10%
Furnace Screw (enameled) per doz. .... 75	
	<b>STOPPERS, FLUE</b>
<b>PUTTY</b>	Common ..... per doz. \$1 10
Commercial Putty, 100-lb. Kits ..... \$3 50	Gem, No. 1. .... per doz. 1 00
	Gem, flat, No. 2. .... per doz. 1 00
<b>QUADRANTS</b>	<b>VENTILATORS</b>
Malleable Iron Damper. .... 10%	Standard ..... 30 to 40%
<b>REDUCERS—Oval Stove Pipe</b>	
Per Doz.	<b>WIRE</b>
7-6, 28-gauge, 1 doz. in carton ..... \$2 00	Plain annealed wire, No. 8 per 100 lbs. .... \$3 00
	Galvanized barb wire, per 100 lbs. .... 3 90
<b>REGISTERS AND BORDERS</b>	Wire Cloth—black painted, 12-mesh, per 100 sq. ft. .... 1 35
Baseboard, Floor and Wall.	Cattle Wire—galvanized catch weight spool, per 100 lbs. .... 3 30
Cast Iron ..... 20%	Galvanized Hog Wire, 30 rod spool, per spool ..... 3 15
Steel and Semi-Steel. .... 40%	Galvanized Plain Wire, No. 8, per 100 lbs. .... 3 55
Baseboard, 1 piece. .... 40-50%	Stove Pipe, per stone. .... 1 10
Baseboard, 2 pieces. .... 40%	
Wall ..... 40%	
Adjustable Calling Ventilators ..... 40%	
<b>Register Faces—Cast and Steel</b>	
Japanned, Bronzed and Plated, 4x8 to 14x14. .... 40%	
Large Register Faces—Cast, 14x14 to 36x42. .... 50%	
Large Register Faces—Steel, 14x14 to 36x42. .... 55%	
<b>Ventilating Register</b>	
Per gross ..... 9 00	
Small, per pair ..... 30	
Large, per pair ..... 50	

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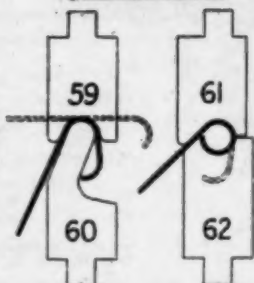
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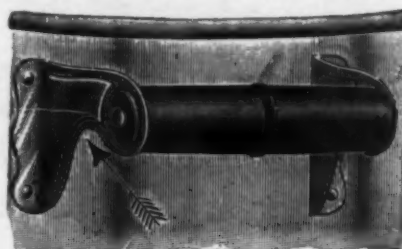
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Chicago, Ill.

**Brakes—Cornice.**  
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Copper & Brass Research As-  
sociation, New York

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Hart & Cooley Co.,  
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Independent Reg. Co.,  
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Tuttle & Bailey Mfg. Co.,  
Chicago, Ill.

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Floral City Heater Co.,  
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**Heaters—School Room.**  
Meyer Furnace Co., The,  
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**Machines—Crimping.**  
Bertsch & Co.,  
Cambridge City, Ind.

**Machinery—Culvert.**  
Bertsch & Co.,  
Cambridge City, Ind.

**Machines—Tinsmith's.**  
Bertsch & Co.,  
Cambridge City, Ind.

**Machines—Tinsmith's.**  
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Detroit, Mich.

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**Machines—Tinsmith's.**  
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**Machines—Tinsmith's.**  
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**Machines—Tinsmith's.**  
Marshalltown Mfg. Co.,  
Marshalltown, Iowa

**Machines—Tinsmith's.**  
Osborn Co., The J. M. & L. A.,  
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**Machines—Tinsmith's.**  
Peck, Stow & Wilcox Co.,  
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**Machines—Tinsmith's.**  
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Co., Chicago, Ill.

**Miters.**  
Friedley-Voshardt Co.,  
Chicago, Ill.

**Miters—Eaves Trough.**  
Milwaukee Corrugating Co.,  
Mil., Ch'go, La Crosse, Kan. City

**Miters—Eaves Trough.**  
Barnes Metal Products Co.,  
Chicago, Ill.

**Miters—Eaves Trough.**  
Lupton's Sons Co., David,  
Philadelphia, Pa.

**Miters—Eaves Trough.**  
Milwaukee Corrugating Co.,  
Mil., Ch'go, La Crosse, Kan. City

**Nails—Hardened Masonry.**  
Parker-Kalon Corp.,  
New York, N. Y.

**Nails—Wire.**  
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Chicago, Ill.

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**Ornaments—Sheet Metal.**  
Gerock Bros. Mfg. Co.,  
St. Louis, Mo.

**Ornaments—Sheet Metal.**  
Milwaukee Corrugating Co.,  
Mil., Ch'go, La Crosse, Kan. City

**Oxygen (Gas).**  
Linde Air Products Co.,  
New York, N. Y.

**Paint.**  
Connors Paint Mfg. Co., Wm.,  
Troy, N. Y.

**Patterns—Furnace and Stove.**  
Cleveland Castings Pattern Co.,  
Cleveland, Ohio

**Patterns—Furnace and Stove.**  
Quincy Pattern Co., Quincy, Ill.  
Vedder Pattern Works,  
Troy, N. Y.

**Pipe and Fittings—Furnace.**  
Burton Co., The W. J.,  
Detroit, Mich.

**Pipe and Fittings—Furnace.**  
Henry Furnace & Fdy Co.,  
Cleveland, Ohio

**Pipe and Fittings—Furnace.**  
Lamneck Co., W. E.,  
Columbus, Ohio

**Pipe and Fittings—Furnace.**  
Meyer & Bro. Co., F., Peoria, Ill.

**Pipe and Fittings—Furnace.**  
Milwaukee Corrugating Co.,  
Mil., Ch'go, La Crosse, Kan. City

**Pipe and Fittings—Furnace.**  
Mueller Furnace Co., L. J.,  
Milwaukee, Wis.

**Pipe and Fittings—Furnace.**  
Osborn Co., The J. M. & L. A.,  
Cleveland, Ohio

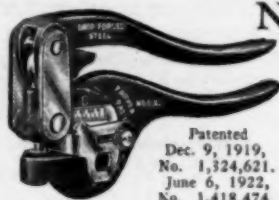
**Pipe and Fittings—Furnace.**  
Standard Furnace & Supply Co.,  
Omaha, Neb.



## HYRO

### No. O. X. PUNCH

*Small but Powerful*



Patented  
Dec. 9, 1919,  
No. 1,324,621.  
June 6, 1922,  
No. 1,418,474.

Capacity— $\frac{1}{4}$ " hole in 14 gauge steel—punches to center of  $2\frac{1}{2}$ " circle—measures 8" overall—weighs but 2 $\frac{3}{8}$  lbs. Front pointer—Side Gauge—Punch with centering tip—Six stock sizes of punches and dies,  $\frac{3}{8}$ ",  $5/32$ ",  $3/16$ ",  $7/32$ ",  $1/4$ " and  $17/64$ ".

### No. X. X. PUNCH

*Wide Open Jaws*

Combination bench and hand punch—unusual deep throat,  $3\frac{1}{2}$ " deep x  $2\frac{1}{8}$ " high—equipped with adjustable back gauge, regulating depth of work—Automatic stripper—Capacity in steel,  $\frac{1}{4}$ " in 14 gauge,  $\frac{3}{8}$ " in 16 gauge, or  $17/32$ " in 18 gauge—measures 9" overall weighs 4 $\frac{1}{2}$  lbs. Fifteen stock sizes of round punches and dies from  $\frac{1}{8}$ " to  $17/32$ ".



Patented April 4, 1922,  
No. 1,411,990.

*Your Jobber Carries Them*

**HYRO MANUFACTURING CO., Inc.**  
**202 VARICK ST. NEW YORK**

The high quality jobs always  
*give the most profit*



is the highest quality  
roofing tin made

**I**T gives *permanent* satisfaction—many records of this famous old roofing tin show over *fifty years'* service.

It is *hand made*, differently dipped---

**Taylor's Extra Coated  
40 lb. Copper Bearing O. H.**

is the nearest thing to it in a machine made plate—therefore, the best of that kind to be had.

**N. & G. TAYLOR COMPANY**  
*Broad and Arch Streets Philadelphia*

*Headquarters for Good Roofing Tin Since 1810*

## CHICAGO STEEL SLITTING SHEAR

**LIGHT—POWERFUL  
DURABLE**



Capacity 10 gauge sheets  
Any Length or Width  
Flat Bars 3/16x2"  
Weight 22 pounds

**Price \$12.50 Net**  
F. O. B. Chicago

Made of pressed steel and equipped with hold-down. Blades of highest grade crucible steel. Most indispensable high grade shears made. Equal to other shears selling at over twice the price. **ORDER YOURS TODAY.**

**DREIS & KRUMP MFG. CO., 7404 Loomis St., Chicago**



Your skill, and the principles and services back of this sign, make a combination that is sure to lead to success—more business, bigger profits and the good will of many satisfied customers.

**ARMCO Distributors' Ass'n of  
America**

**Executive Offices: Middletown, Ohio**

**I**F there is a tool or machine that you need and you don't know where to get it—

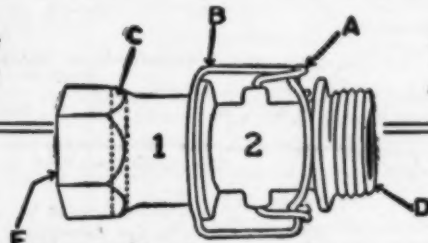
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**Notes and Queries Dept.**

*of*

**AMERICAN ARTISAN**

*The simplest  
hose  
coupling  
made*



*Snaps  
on or off  
quickly.  
Does  
not leak.*

### HESSLER Perfect Hose Connection

**Y**OU and your customers, everybody who uses a hose will welcome the Hessler Hose Connection. It saves hose length and the hose, no kinking or twisting—no splashing, no leakage and you snap it on or off in a wink. The Hessler will be a big, fast seller and a real profit maker.

Order a sample lot now—made in four sizes. Write today for price and circulars.

**H. E. HESSLER CO.**

**Syracuse, New York**

# BUYERS' DIRECTORY

## Pipe and Fittings—Stove.

Meyer & Bro. Co., F., Peoria, Ill.  
Milwaukee Corrugating Co.,  
Mil., Ch'go, La Crosse, Kan. City

## Pipe—Conductor.

Barnes Metal Products Co., Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Chicago Metal Mfg. Co., Chicago, Ill.  
Dieckmann Co., Ferdinand, Cincinnati, Ohio  
Friedley-Voshardt Co., Chicago, Ill.  
Lupton's Sons Co., David, Philadelphia, Pa.  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
New Jersey Zinc Sales Co., The, New York, N. Y.  
Wheeling Corrugating Co., Wheeling, W. Va.

## Presses.

La Salle Machine Works, Chicago, Ill.

## Punches.

Bertsch & Co., Cambridge City, Ind.  
Interstate Machinery Co., Chicago, Ill.  
La Salle Machine Works, Chicago, Ill.  
Peck, Stow & Wilcox Co., Southington, Conn.  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Whitney Mfg. Co., W. A., Rockford, Ill.

## Punches—Combination Bench and Hand.

Hyro Mfg. Co., New York, N. Y.  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Whitney Mfg. Co., W. A., Rockford, Ill.

## Punches—Hand.

Hyro Mfg. Co., New York, N. Y.  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Whitney Mfg. Co., W. A., Rockford, Ill.

## Putty—Stove.

Connors Paint Mfg. Co., Wm., Troy, N. Y.

## Radiator Cabinets.

The Hart & Cooley Mfg. Co., New Britain, Conn.  
Tuttle & Bailey Mfg. Co., Chicago, Ill.

## Radiators—Shields.

Beh & Co., Inc., New York, N. Y.

## Ranges—Combination Gas & Coal.

Quick Meal Stove Co., St. Louis, Mo.  
Thatcher Co., Newark, N. J.

## Ranges—Gas.

Quick Meal Stove Co., St. Louis, Mo.

## Register Shields.

Beh & Co., Inc., New York, N. Y.

## Registers—Warm Air.

Auer Register Co., Cleveland, Ohio  
Forest City-Walworth Run Foundries Co., Cleveland, O.  
Hart & Cooley Co., New Britain, Conn.  
Henry Furnace & Fdy. Co., Cleveland, Ohio  
Lamneck & Co., W. E., Columbus, Ohio  
Meyer & Bro. Co., F., Peoria, Ill.  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Mueller Furnace Co., L. J., Milwaukee, Wis.  
Stearns Register Co., Detroit, Mich.  
Standard Furnace & Supply Co., Omaha, Neb.  
Tuttle & Bailey Mfg. Co., Chicago, Ill.

## Registers—Wood.

American Wood Register Co., Plymouth, Ind.  
Auer Register Co., Cleveland, Ohio  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
L. J. Mueller Furnace Co., Milwaukee, Wis.

## Repairs—Stove and Furnace.

Hessler Co., H. E., Syracuse, N. Y.

## Ridging.

Armco Distributors Ass'n of America, Middletown, Ohio  
Lupton's Sons Co., David, Philadelphia, Pa.  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

## Rivets—Stove.

The Kirk-Latty Co., Cleveland, Ohio  
Lamson & Sessions Co., Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

## Rods—Stove.

The Kirk-Latty Co., Cleveland, Ohio  
Lamson & Sessions Co., Cleveland, Ohio

## Rolls—Forming

Bertsch & Co., Cambridge City, Ind.

## Roofing—Cement

Connors Paint Mfg. Co., Wm., Troy, N. Y.

## Roof—Flashing.

Hessler Co., H. E., Syracuse, N. Y.  
Milwaukee Corrugating Co., Milwaukee, Wis.

## Roofing—Iron and Steel

Armco Distributors Ass'n of America, Middletown, Ohio  
Burton Co., The W. J., Detroit, Mich.  
Friedley-Voshardt Co., Chicago, Ill.  
Inland Steel Co., Chicago, Ill.  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Wheeling Corrugating Co., Wheeling, W. Va.

## Roofing—Tin.

Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Taylor Co., N. & G., Philadelphia, Pa.  
Wheeling Corrugating Co., Wheeling, W. Va.

## Roofing Tools.

Wm. Eiermann, Brooklyn, N. Y.  
New Jersey Zinc Sales Co., The, New York, N. Y.

## Robbish Burners.

Hart & Cooley Co., New Britain, Conn.

## Schools—Sheet Metal Pattern Drafting.

St. Louis Technical Institute, St. Louis, Mo.

## Schools—Warm Air Heating.

St. Louis Technical Institute, St. Louis, Mo.

## Screws—Hardened Metallic Drive.

Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Parker-Kalon Corp., 200 Varick St., New York

## Screws—Hardened Self-Tapping, Sheet Metal.

Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Parker-Kalon Corp., 200 Varick St., New York

## Screens—Perforated Metal.

Harrington & King Perforating Co., Chicago, Ill.

## Shears—Hand and Power.

Interstate Machinery Co., Chicago, Ill.  
Marshalltown Mfg. Co., Marshalltown, Iowa  
Peck, Stow & Wilcox Co., Southington, Conn.  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Unishear Co., Inc., New York, N. Y.  
Viking Shear Co., Erie, Pa.

## Sheet Metal Screws—Hardened, Self-Tapping.

Parker-Kalon Corp., 200 Varick St., New York

## Sheets—Black and Galvanized.

Armco Distributors Ass'n of America, Middletown, Ohio  
Burton Co., The W. J., Detroit, Mich.  
Inland Steel Co., Chicago, Ill.  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Taylor Co., N. & G., Philadelphia, Pa.  
Wheeling Corrugating Co., Wheeling, W. Va.

## Sheets—Iron.

Armco Distributors Ass'n of America, Middletown, Ohio  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

## Sheets—Tin.

Taylor Co., N. & G., Philadelphia, Pa.

## Sheets—Zinc.

New Jersey Zinc Sales Co., The, New York, N. Y.

## Shingles and Tiles—Metal.

Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Wheeling Corrugating Co., Wheeling, W. Va.

## Sifters—Ash.

Diener Mfg. Co., G. W., Chicago, Ill.

## Sky Lights.

Lupton's Sons Co., David, Philadelphia, Pa.  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

## Snips.

Peck, Stow & Wilcox Co., Southington, Conn.  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

## Solder.

Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

## Soldering Furnaces.

Burgess Soldering Furnace Co., Columbus, Ohio  
Diener Mfg. Co., G. W., Chicago, Ill.  
Quick Meal Stove Co., St. Louis, Mo.  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

## Specialties—Hardware.

Diener Mfg. Co., G. W., Chicago, Ill.  
Hessler Co., H. E., Syracuse, N. Y.

## Stars—Hard Iron Cleaning.

Fanner Mfg. Co., Cleveland, Ohio

## Statuary.

Friedley-Voshardt Co., Chicago, Ill.  
Gerock Bros. Mfg. Co., St. Louis, Mo.

## Steel Pipe—Welded.

Chicago Metal Mfg. Co., Chicago, Ill.

## Stove Pipe Reducers.

Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

## Stoves—Camp.

Quick Meal Stove Co., St. Louis, Mo.

## Stoves—Gasoline and Oil.

Quick Meal Stove Co., St. Louis, Mo.

## Stoves and Ranges.

Quick Meal Stove Co., St. Louis, Mo.  
Thatcher Co., Newark, N. J.

## Tinplate.

Burton Co., The W. J., Detroit, Mich.  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Taylor Co., N. & G., Philadelphia, Pa.

## Tools—Roofers.

Wm. Eiermann, Brooklyn, N. Y.

## Tools—Tinsmith's.

Bertsch & Co., Cambridge City, Ind.  
Burton Co., The W. J., Detroit, Mich.  
Dries & Krump Mfg. Co., Chicago, Ill.  
Hyro Mfg. Co., New York, N. Y.  
Interstate Machinery Co., Chicago, Ill.  
Marshalltown Mfg. Co., Marshalltown, Iowa  
Osborn Co., The J. M. & L. A., Cleveland, Ohio  
Peck, Stow & Wilcox Co., Southington, Conn.  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Viking Shear Co., Erie, Pa.  
Whitney Mfg. Co., W. A., Rockford, Ill.

## Turches.

Burgess Soldering Furnace Co., Columbus, Ohio  
Diener Mfg. Co., G. W., Chicago, Ill.  
Quick Meal Stove Co., St. Louis, Mo.  
Ryerson & Son, Inc., Jos. T., Chicago, Ill.  
Trade Extension Association, New York, N. Y.  
Sheet Steel Trade Extension Committee, Pittsburgh, Pa.

## Trimings—Stove.

Fanner Mfg. Co., Cleveland, Ohio

## Ventilators

Aeolus Dickinson Co., Chicago, Ill.  
Akrot Ventilators, Inc., Chicago, Ill.  
Arex Company, Chicago, Ill.  
Berger Bros. Co., Philadelphia, Pa.  
Friedley-Voshardt Co., Chicago, Ill.  
Kernchen Co., Chicago, Ill.  
Lupton's Sons Co., David, Philadelphia, Pa.  
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City  
Standard Ventilator Co., Lewisburg, Pa.

## Ventilators—Ceiling.

Hart & Cooley Co., New Britain, Conn.  
Henry Furnace & Fdy. Co., Cleveland, Ohio  
Tuttle & Bailey Mfg. Co., New York

## Windows—Steel.

Lupton's Sons Co., David, Philadelphia, Pa.

## Zinc.

New Jersey Zinc Co., The, New York, N. Y.



## WANTS AND SALES

Yearly subscribers to the **AMERICAN ARTISAN** may insert advertisements of not more than fifty words in our Want and Sales Columns **WITHOUT CHARGE**.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired and must reach our office by Thursday of the week of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines, employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

## BUSINESS CHANCES

**Lightning Rods**—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddle Company, Marshfield, Wis.

**For Sale**—Tin shop, plumbing business, auto radiator repairing and welding business. Also carry a small stock of hardware, stoves and furnaces. Have the Johns-Manville asbestos shingle agency. In town of 1,500—140 miles west of St. Louis. Good schools and churches. Established 9 years. Fine business. Selling on account of being injured. Will sell with or without shop, 20x70 brick, with living quarters. Address M-481, **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Ill.

**For Sale**—Warm Air Heating and Sheet Metal Business in city of 30,000 population. Good farming and dairy country. Address Y-480, **AMERICAN ARTISAN**, 620 So. Michigan Avenue, Chicago, Illinois.

## SITUATION WANTED

Position wanted by first-class tinner and furnace man. Age 35 years. Nearly 20 years' experience. Good pattern cutter and have engineering knowledge of warm air heating. Desire connection with reliable firm. State wages and full particulars. Address P. O. Box 175, Elmer, Mo. G-481

Combination sheet metal, plumbing and furnace man wants steady year around position. Middle aged, married, sober. Prefer either Iowa, Nebraska or Kansas. Address "Plumber," 405 West Grand Prairie Street, Palestine, Ill. E-481

Situation wanted by a first class all around sheet metal worker as working foreman; can read blue prints, cut patterns and handle any kind of work coming into a job shop; 27 years at the trade—inside and outside work; South preferred. Address Edward G. Collins, Box 603, Weldon, N. C. Y-481

Wanted—Permanent position by experienced tinner and plumber. Can also do water and warm air heating; can furnish references from past employers; can come at once. Address X-481, **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois.

## SITUATION WANTED

Position wanted by first-class sheet metal worker as working foreman for work as may come in first-class sheet metal shop. Can read blue prints, figure work, cut patterns and do work if required. Best of references furnished. Address P. O. Box 603, Weldon, N. C. J-481

Position wanted by all around tinner. 25 years' experience. Can do outside and inside work, also furnace work. Married and can come at once. Address W. J. Mack, 212 First Avenue South, St. Charles, Ill. H-481

I am desirous of purchasing a sheet metal shop in a town of at least 10,000 population. Please state full particulars. Address L-481, **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Ill.

## SITUATION WANTED

A salesman with years of successful experience selling to jobbers and retailers throughout the U. S. wants to form connection with manufacturer of furnace pipe fittings, supplies or sheet metal or sheet metal contractors' supplies. Best of references. Correspondence solicited. Address F-481, **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Ill.

## HELP WANTED

Wanted—Tinner and handy man. Steady work and two furnished rooms included. State wages. Address Eckhard Mercantile Co., 512 E. Broadway, Alton, Illinois. R-481

Wanted at once—First-class manager. Must be familiar with estimating, plumbing and heating, handling men, a hustler and business getter. A real opportunity for a man who is seeking advancement. Address D-481, **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Ill.



Are You looking  
for more sales?

**W**ARM Air Furnace and Furnace Supply Manufacturers who are desirous of securing high grade sales managers and worth while traveling men will find that a Special Notice advertisement in these columns will produce results.

## AMERICAN ARTISAN

has put many a good man in touch with progressive manufacturers.

This is the best personnel market page in the field—use it.

## HELP WANTED

We need a man between 30 and 40 years of age to do general outdoor work. He must also be a good furnace man for repairing and installing. Want a hustler and must have good reason for quitting present employer. Let us hear from you at once. Address P-481, **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois.

Wanted—All around, first class sheet metal worker to take charge of shop; must be fully experienced on all classes of work. This is a steady position and if you are looking for something temporary do not answer. Address Meyers Sheet Metal Works, Janesville, Wisconsin. S-481

Wanted at once, all around man to do class of work that comes in a country tin shop; must be able to do plumbing and drive a car; want a sober man and one who will be on the job. Wages \$30 per week year around. Address T-481, **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois.

Wanted—A first class sheet metal worker and a good furnace installer; 87½ cents per hour. Address W-481, **AMERICAN ARTISAN**, 620 South Michigan Avenue, Chicago, Illinois.

Wanted at Once—Sheet metal worker and furnace installer. Only capable man need apply. State wages expected when replying. Address Hurdle Hardware, Rock Falls, Illinois. A-481

Wanted—First class sheet metal worker and furnace man. None but A-1 mechanic need apply. Address Jno. F. Cartwright, Bowling Green, Ky. M-480

## TINNERS' TOOLS

**For Sale**—1 8-ft. cast iron Robinson Brake, 1 pair 30-in. Square Shears. First check for \$100.00 takes both f. o. b. Muskegon. Address The Alamo Furnace Company, 541 West Western Avenue, Muskegon, Michigan. C-481

**For Sale**—Set of Tinner's tools, all in good condition. A bargain if taken at once. Address Manrow Sheet Metal Company, 1328 So. Main Street, Elkhart, Indiana. B-481

**To Trade**—40-acre tract prospective coal and oil land near the Poteau, Oklahoma gas field, for a complete set of tinner's tools, including steel brake. For further information address H. S. Glenn, Mountain Grove, Missouri. O-481

Wanted—Used 9-foot brake, 36-inch square shear, 30-inch bar folder in good condition; state price and make in first letter. Address Wm. R. Trappe, 1194 Garfield street, Hammond, Indiana. Z-481

## BOOKS

The problem of keeping an accurate set of books is one which gives many sheet metal contractors a lot of trouble. A new and very simple system called the **National Faultless System** makes it possible for you to be your own bookkeeper. It is really four books in one. It contains records for four years and ALL transactions and records for one month are recorded on **ONE PAGE**. This system eliminates cash book, day book and journal, but qualifies every transaction of a full month's business on one sheet. Many other features. Write, for full details, Book Dept., **AMERICAN ARTISAN**, 620 South Michigan Ave., Chicago.



**THE STANDARD  
FOR MANY YEARS**  
It Pulls Business Your Way!

**KERNCHEN SIPHONAGE  
VENTILATOR**



**"IT PULLS"**

SUPPLY your next job with "K.S.V." and you never will have a complaint. Complete stock on hand for prompt shipment.

Write to-day for complete data and prices  
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Exhaust and Blow Piping, by Hayes—Exhaust and Blow Piping has had an unusually big demand. A fresh supply is now off the press and is in our hands for immediate delivery. It has an invaluable treatise on the planning, cost, estimation and installation of fan piping in all its branches giving all necessary guidance in fan work blower and separator construction. 159 pages, 5x8. 51 figures. Cloth, \$2.00. Order from Book Dept., AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois.

## OPPORTUNITY BRANCH MANAGER

One of the country's largest and longest established manufacturers of warm air furnaces and heating equipment desires the services of wide-awake men to take charge of direct factory branches in various cities. The proposition will be a substantial salary, and profit-sharing arrangement in addition. The merchandise is well and favorably known to the public.

Unusual cooperation will be given, intending that the man dominate the heating business in the town in which they locate him. The man chosen must be that rare combination—executive salesman, and collector. He will be given full charge of the entire branch. He will be able to present a very complete service to the home owner or home builder, for a complete heating plant direct from the factory.

This is an exceptional opportunity for a reliable and energetic man. Heating experience is not absolutely necessary, although applicants with warm air heating experience or knowledge will naturally be given preference, other things being equal. This would also warrant attention from one now engaged in the heating business with limited capital or an unsatisfactory line, who feels he could do bigger things with the proper backing. Probably you know such a man. If so, refer him to this advertisement also.

No attention will be given your reply unless you set forth clearly the following information: 1, age; 2, married; 3, have you car or truck, if so what kind; 4, a definite record of what you have been doing for the past ten years, together with earning power; 5, what you are doing now; 6, why you wish to change; 7, when you can leave; 8, what your living expenses are at present; 9, what salary you would wish to start with; 10, in what town you prefer to operate; 11, tell us in your own language what you think you can do with the proper line and proper working capital.

All replies will be strictly confidential.

Address, L. L. S., 337 West Fifth Street, Cincinnati, Ohio.  
A482

## BOOKS

The Ventilation Handbook, by Charles L. Hubbard. A practical book designed to cover the principles and practice of ventilation as applied to furnace heating ducts, flues and dampers for gravity heating; fans and fan works for ventilation and hot blast heating by means of a comprehensive series of questions, answers and very plain descriptions easy to understand. Price \$2.00. Order from Book Dept., AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois.

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## PATENTS

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Patent Attorney  
Barrister Bldg., WASHINGTON, D. C.

INDIANA AND WISCONSIN TERRITORIES OPEN FOR GOOD LIVE FURNACE SALESMEN WITH CLEAN RECORDS. WRITE IN FULL CONFIDENCE. ADDRESS B482, CARE OF AMERICAN ARTISAN, 620 SOUTH MICHIGAN AVE., CHICAGO, ILL.

## FOR SALE

Our complete line of Simplex and Supreme Furnace pattern equipment and flasks at a tremendous sacrifice. Address Simmplex Furnace Company, Racine, Wis. T480

## BOOKS

Manual of Automotive Radiator Construction and Repair, by F. L. Curfman and T. H. Leet—Anyone interested in Radiator Repairing will find the 185 pages of practical instructions and the 120 illustrations showing actual construction and repairing a big help. In a condensed manner some four to five thousand answers to questions are given. It is thoroughly practical as both authors are men of wide experience in this work. Printed in large, easy to read type. Measures 5 1/2 x 8 inches. Price \$2.50. Order from Book Dept., AMERICAN ARTISAN, 620 South Michigan Avenue, Chicago, Illinois.



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**TEST ITS PULLING POWER  
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EFFICIENCY**  
A Quality Product  
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**AKKRAT VENTILATORS, INC.**  
1191 Builders Bldg. CHICAGO

Below: Showing how Parker-Kalon Sheet Metal Screws anchor roofing and insulation to the steel plates of the roof.



University of Minnesota Field House; C. H. Johnston, Architect; The Madsen Construction Co. General Contractors; Ray Roofing Co., St. Paul, Roofing Contractors.

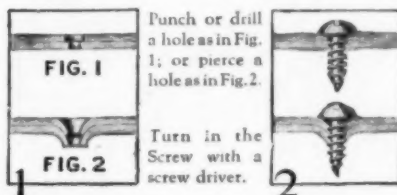
## 60,000 Sheet Metal Screws

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for all time . . . .*

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